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2018-19 Graduate Bulletin

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VCU

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GRADUATE BULLETIN

The Virginia Commonwealth University bulletins are published yearly for each of the student populations served by the institution. The Graduate Bulletin contains information about university policies, course descriptions and academic requirements for the programs offered to graduate students.

Visit our **FAQ page** for additional information.

ABOUT VCU

Located in the heart of Richmond, the capital of Virginia since 1779, Virginia Commonwealth University serves an integral role in the economic health of the city and the state, educating the current and future work force, reaching out to the community, advancing research and enhancing patient care.

VCU was founded in 1838 as the medical department of Hampden-Sydney College, becoming the Medical College of Virginia in 1854. In 1968, the General Assembly merged MCV with the Richmond Professional Institute, founded in 1917, to create Virginia Commonwealth University.

Today, VCU offers comprehensive undergraduate, master's, doctoral and professional programs and encompasses one of the largest academic health centers in the nation. With $275 million in externally funded research awards for the 2017 fiscal year, VCU is one of only 28 public universities in the country with an academic medical center to be designated as a research university with very high research activity as well as a Community Engaged Institution, both by the Carnegie Foundation. Its centers and institutes of excellence support the university's research mission and involve faculty from multiple disciplines in the arts, public policy, biotechnology and health care discoveries.

VCU enrolls more than 31,000 students in more than 200 degree and certificate programs in the arts, sciences and humanities. Thirty-eight of the programs are unique in Virginia, many of them crossing the disciplines of VCU's 13 schools and one college. VCU has a full-time instructional faculty of more than 2,300 who are nationally and internationally recognized for excellence in the arts, business, education, engineering, the humanities, the life sciences, social work and all the health care professions. With more than 22,000 employees, VCU and the VCU Health System also have a significant impact on Central Virginia's economy.

Building on the foundation of VCU's nationally ranked academic programs and academic medical center, research and scholarly productivity, and engagement with the communities it serves, the university's recently completed strategic plan, Quest for Distinction (2012-2018), launched a new vision for VCU: to elevate its stature and become the nation's top urban, public research university. This focused plan capitalized on the outstanding assets of the VCU experience and truly distinguished VCU as a major research university committed to academic quality and student success at all levels.

Quest for Distinction also embodied VCU's commitment to human health through the VCU Medical Center, which includes the university's health sciences schools and offers state-of-the-art care in more than 200 specialty areas, many of national and international note, including organ transplantation, head and spinal cord trauma, burn healing and cancer treatment. A new strategic plan, Quest 2025:Together We Transform, will launch in the fall.

VCU and the VCU Health System have been honored with prestigious national and international recognition for top-quality graduate, professional and medical-care programs, reflecting a commitment to be among America's top research universities focused on student learning.

Nondiscrimination

VCU does not discriminate in admissions, treatment, employment or access to its programs or activities on the basis of race, color, religion, national origin (including ethnicity), age, sex (including pregnancy, childbirth and related medical conditions), parenting status, marital status, political affiliation, veteran status, genetic information (including family medical history), sexual orientation, gender identity, gender expression or disability, consistent with applicable law.

VCU's notice of nondiscrimination and nondiscrimination policies, with contact information for the office and individuals responsible for enforcement, are in the university's policy library (https://policy.vcu.edu).

Administration

VCU administration provides leadership and organizational structure for the university, overseeing its goals and mission. Refer to each unit's website (http://atoz.vcu.edu/administration) for a current listing of administrators.

Deans

Deans provide leadership for their respective school or college. Refer to each unit's website (http://atoz.vcu.edu/academic+departments/organizations) for a current listing of its deans, departmental chairs and program heads.

Accreditation

Virginia Commonwealth University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, master's, doctoral and first professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097; telephone: (404) 679-4500. Note: The Commission is to be contacted **only** if there is evidence that appears to support an institution's significant noncompliance with a requirement or standard.

Academic program accreditation

See the college/schools for detailed information about program accreditation.

Specialized program accreditation or certification

Campus Police

Police Department
International Association of Campus Law Enforcement Administrators

Police Academy
Certified by the Virginia Department of Criminal Justice Services

Division of Student Affairs

University Counseling Services
American Psychological Association

Student Health Services
Joint Commission on Accreditation of Health Care Organizations

Hospital accreditation

VCU Health System
Joint Commission on Accreditation of Healthcare Organizations

Mission statement

As the premier urban, public research university in Virginia, VCU's mission is to advance knowledge and student success through its commitments to:

- An engaged, learner-centered environment that fosters inquiry, discovery and innovation in a global setting
- Research that expands the boundaries of new knowledge and creative expression and promotes translational applications to improve human health
- Interdisciplinary collaborations that bring new perspectives to complex problems and mobilize creative energies that advance innovation and solve global challenges
- Health care that strives to preserve and restore health for all people, to seek the cause and cure of diseases through groundbreaking research, and to educate those who serve humanity
- Diversity that provides a climate of inclusion, a dedication to addressing disparities wherever they exist, and an opportunity to explore and create in an environment of trust
- Sustainable, university-community partnerships that enhance the educational, economic and cultural vitality of the communities VCU serves in Virginia and around the world

Vision statement

VCU will be a premier urban, public research university distinguished by its commitment to:

- The intellectual and academic success of a diverse student body
- Research and discovery that advances knowledge, inspires creativity and improves human health
- The global engagement of students, faculty and staff that transforms lives and communities

Core values

1. **Accountability –** committing to the efficient and transparent stewardship of our resources to achieve institutional excellence
2. **Achievement –** ensuring distinction in learning, research and scholarly pursuits, service, and patient care
3. **Collaboration –** fostering collegiality and cooperation to advance learning, entrepreneurship and inquiry
4. **Freedom –** striving for intellectual truth with responsibility and civility, respecting the dignity of all individuals
5. **Innovation –** cultivating discovery, creativity, originality, inventiveness and talent
6. **Service –** engaging in the application of learning and discovery to improve the human condition and support the public good at home and abroad
7. **Diversity –** ensuring a climate of trust, honesty and integrity where all people are valued and differences are recognized as an asset
8. **Integrity –** adhering to the highest standards of honesty, respect and professional and scholarly ethics

Oak Ridge Associate Universities Consortium

Since 1963, students and faculty have benefited from VCU's membership in Oak Ridge Associated Universities, a consortium of 115 colleges and universities and a contractor for the U.S. Department of Energy. ORAU works with its member institutions to help students and faculty gain access to federal research facilities, to keep its members informed about opportunities for scholarship and research appointments and to organize research alliances among its members.

Faculty, graduate students and undergraduate students may access a wide range of opportunities for study and research, including the Lindau-Nobel Laureates and Powe Junior Faculty programs. Many of these programs are designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines.

For more information about ORAU and its programs, contact:

- Francis L. Macrina, Ph.D., ORAU Councilor for VCU
  (804) 827-2262
- Monnie E. Champion, ORAU Corporate Secretary
  (865) 576-2206

Interested parties may also visit the ORAU website at orau.org (http://www.orau.org).

VCU Health System Authority

In April 1996, Gov. George Allen signed legislation that established the Medical College of Virginia Hospitals Authority. Effective July 1, 1997, the operations, employees and obligations of MCV Hospitals (formerly a division of VCU) were transferred to the Authority. Three years later, in connection with legislation signed by Gov. James Gilmore, the MCV Hospitals Authority became the Virginia Commonwealth University Health System Authority. The clinical activities of MCV Hospitals, MCV Physicians and the VCU School of Medicine are now coordinated and integrated by and through VCU Health.

The VCU Health System Authority is charged by statute with the missions of operating MCV Hospitals as teaching hospitals for the benefit of the health sciences schools of VCU, providing high quality patient care and providing a site for medical and biomedical research, all of which missions are required to be performed in close affiliation with the Office of the Vice President for Health Sciences. VCU's vice president for health sciences also serves as the CEO of the VCU Health System Authority, and five VCU faculty physicians serve as members of the VCU Health board of directors.

Board of Visitors

The Board of Visitors is the voting body of Virginia Commonwealth University. Each year, the governor of Virginia appoints members. Refer to Office of the President's website (http://www.president.vcu.edu/board) for a current listing of board members.

Determination of student classification for in-state tuition purposes

Tuition is determined by the number of credit hours a student is taking, the student's residency classification, course of study and classification level. For in-state tuition benefits, the student must comply with the Code of Virginia (https://law.lis.virginia.gov/vacode/title23.1/chapter5) regulations relative to in-state tuition and reduced rate tuition eligibility.

All applicants to VCU who wish to be considered for in-state tuition rates as Virginia residents must submit the Application for Virginia In-

state Tuition Rates. This application is a part of the admissions packet and the nondegree-seeking student enrollment package. The residency determination of the applicant is conveyed at the time of admission as a degree-seeking student or nondegree-seeking student.

New and continuing students initially classified as non-Virginians for tuition purposes may request a review of the initial residency determination by completing an Application for Change of Domicile available from the Office of Records and Registration (online). The student must present clear and convincing evidence that he or she is not residing in the state primarily to attend school. The application deadline is the end of the add/drop period of the semester, and it is the responsibility of the student to establish or to file an appeal to change his/her residency classification prior to the start of classes for the semester under consideration. In accordance with the Code of Virginia, applications received after the deadline must be considered for the next semester. Submit completed applications with documentation to the university residency appeals officer. Processing may require four to six weeks; therefore it is strongly recommended that applications be submitted earlier than the stated deadline.

The university's service to students is limited to assuring that they understand the procedures for appealing and that they have access to information about the relevant sections of the Code of Virginia. The university provides information about the steps of the process and access to the applicable sections of the statute and the associated guidelines. The university provides qualified staff to review the appeals and make decisions based on the information students provide. The university representative cannot provide advisement to students as to how to present their case for review; neither can they become the student's advocate since these university representatives must make the decision.

Students approved for a change to in-state status for tuition purposes are notified by mail with copies of their approval letters sent to the Office of Financial Aid and the Office of Student Accounting. Students denied this status are also notified by mail. The denial letter informs the student of procedures for appeal of this decision, to include filing an appeal with the university residency appeals committee. Students who submit fraudulent applications, falsify documentation or conceal information will be subject to reclassification, payment of all nonresident fees owed and university discipline.

Please note that a student with in-state status for tuition purposes who exceeds 125 percent of the credit hours needed to complete his program will be assessed a tuition surcharge.

Rights of students under the Family Educational Rights and Privacy Act

Pursuant to a federal statute enacted to protect the privacy rights of students (Family Educational Rights and Privacy Act of 1974 [FERPA], as amended, enacted as Section 438 of the General Education Provisions Act), eligible students of Virginia Commonwealth University are permitted to inspect and review education records of which the student is the subject. A statement of university policy concerning inspection and disclosure of education records has been formulated in compliance with the federal statute. Copies of the policy also are available from the Office of Records and Registration or on the Web at rar.vcu.edu/registration/familyed.html (http://rar.vcu.edu/registration/familyed.html).

Generally, the act provides that no personally identifiable information will be disclosed without the student's consent, except for directory information and information to other school officials with a legitimate educational interest. When personally identifiable information, other than directory information, is disclosed, a record will be maintained of these disclosures. This record also is available for inspection and review by the student.

If an eligible student feels that his or her education record is inaccurate, misleading or otherwise in violation of the student's privacy or other rights, the student may request an amendment to the record.

Should the university fail to comply with the requirements of the act, the student has the right to file a complaint with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Ave., S.W., Washington, D.C. 20202-5901.

Parental notification amendment

Amendments to FERPA signed into federal law in fall 1998 specifically allow notification to the parents or guardians of students under the age of 21 who violate any law or university rule regarding use or possession of alcohol or other controlled substance. The Virginia Attorney General's Task Force on Drinking by College Students also recommended such notification in its 1998 report.

In accordance with these documents, a parental notification procedure has been included in the VCU Drug Free Schools and Workplace Policy.

Consumer information

The federal Higher Education Opportunity Act of 2008 requires that institutions of higher education disclose certain consumer information to current students, prospective students, current employees and/or prospective employees. This consumer information (http://www.opds.vcu.edu/consumer-info) for VCU is maintained by the Office of Planning and Decision Support.

ACADEMIC REGULATIONS

This section of the Bulletin covers academic regulations and includes universitywide policies, which pertain to all students, as well as those specific to undergraduates and graduate students.

It is the responsibility of all students, both on- and off-campus, to be familiar with the academic regulations in individual school and department publications and on program websites; however, in all cases, the official policies and procedures of the university, as published on this website, take precedence over individual program policies and guidelines.

Students are also subject to any policy changes approved by the university for immediate implementation and published on the Bulletins website for the current academic year.

Universitywide regulations

Regulations presented in this section apply to all VCU students unless otherwise noted. Use the navigation to the left to see additional regulations that are specific to the level of study.

Current mailing address

Every VCU student is responsible for keeping a current mailing address on file with the Office of Records and Registration. Please verify your current address on eServices (https://my.vcu.edu).

If a student's mailing address is not accurate, the student should use eServices (https://my.vcu.edu) to make changes. Students may also submit any change of address in writing to the Office of Records and Registration, Harris Hall, Box 842520, Richmond, VA 23284-2520 or in person at the Student Services Center in Harris Hall, 1015 Floyd Ave.

All official mailings are sent to the permanent address on file in the Office of Records and Registration.

Email is considered an official method for communication at VCU because it delivers information in a convenient, timely, cost-effective and environmentally aware manner. Mail sent to a student's VCU email address may include notification of university-related actions, including disciplinary action. Students who use email addresses other than their required name@vcu.edu email address also must check their name@vcu.edu address frequently for official messages from the university.

Attendance

The instructional programs at VCU are based upon a series of class meetings involving lectures, discussions, field experiences, special readings and reporting assignments. Therefore it is important for each student to be in attendance on a regular basis. A student who misses a class session is responsible for completing all material covered or assignments made during the absence.

Students must be informed in writing of the attendance requirements and the corresponding consequences of poor attendance for the courses and/or program in which they are enrolled. Though the attendance requirements may vary widely from one course to another, students must abide by these requirements. Students cannot enroll in two courses that meet concurrently without written approval from the chair of each department involved.

Consequences of poor attendance

Students having attendance problems should contact the instructor to explain the reasons for nonattendance and to discuss the feasibility of continuing in the course. If the student has fallen so far behind that the successful completion of the course is impossible, the student should withdraw from the course before the end of the first 10 weeks of classes.

If the student continues to miss class and does not officially withdraw from the course, the instructor may withdraw the student for nonattendance with a mark of W before the end of the first 10 weeks of classes or may assign an academic grade at the end. Withdrawals are not permitted after the end of the first 10 weeks of classes. For classes that do not conform to the semester calendar, the final withdrawal date occurs when half of the course has been completed. Withdrawal dates for summer session classes are provided on the Summer Studies Calendar (http://www.summer.vcu.edu/calendar).

Religious observances

It is the policy of VCU to accord students, on an individual basis, the opportunity to observe their traditional religious holidays. Students wishing to observe a religious holiday of special importance must provide advance written notification to each instructor by the end of the second week of classes. On these dates, instructors are encouraged to avoid scheduling one-time-only activities that cannot be replicated. Through such strategies as providing alternative assignments or examinations, granting permission for audio or video recordings or the use of the Internet, faculty members are expected to make reasonable academic accommodations for students who are absent because of religious observance.

Mandated short-term military training

Students called to report for mandated military training must provide advance written notification to each instructor several weeks in advance of training. Faculty members are expected to make reasonable academic accommodations for students who are absent because of mandated short-term military training (short-term is defined as several days not to exceed two weeks).

Course drop vs. withdrawal

A student may drop a class during the add/drop registration period only. When a class is dropped, the registration and associated tuition/fee charges are cancelled. Drop charges are removed to indicate that the student never attended the class or never attended the class beyond the add/drop registration period.

A student may withdraw from a class up to the withdrawal deadline as published in the university academic calendar (http://www.vcu.edu/academiccalendars). Withdrawal from a course does not cancel the registration or the associated tuition/fee charges and results in the assignment of the grade of W. Refunds, if applicable, are issued in accordance with procedures described in the refunds section of the tuition and student fees (p. 45) section of this bulletin.

In both situations, any financial aid already disbursed to the student's account based on the original course registration will be assessed and adjusted according to the university refund policy and may result in a balance due to the university.

Student conduct in the classroom

The instructional program at VCU is based upon the premise that students enrolled in a class or clinic are entitled to receive instruction free from interference by other students. Accordingly, in classrooms, laboratories, studios and other learning areas, students are expected to conduct themselves in an orderly and cooperative manner so that the faculty member can proceed with customary instruction. Faculty members (including graduate teaching assistants) may set reasonable standards for classroom behavior in order to meet these objectives. If a student believes that the behavior of another student is disruptive, the faculty member should be informed.

If a faculty member believes that a student's behavior is disrupting the class and interfering with normal instruction, the faculty member may direct the student to leave the class or clinic for the remainder of the class period. In such circumstances, the faculty member is the sole judge that the student's behavior is sufficiently disruptive to warrant a temporary dismissal from the classroom or clinic. Disruptive behavior on the part of the student may result in the filing of formal charges under the university's Rules and Procedures document (https://www.policy.vcu.edu/sites/default/files/Rules%20and%20Procedures.pdf).

Grade review procedures

Students have a right to appeal course grades they consider to have been arbitrarily or capriciously assigned or assigned without regard for the criteria, requirements and procedures of the course stated in the syllabus or guidelines for assignments. Grades determined by actions under authority of the VCU Honor System may not be appealed through this procedure, nor may dismissals that have occurred as a result of correctly derived course grades.

Though the faculty has the responsibility for assigning grades on the basis of academic criteria, such grade designations can sometimes raise conflicts. Thus, while affirming the importance of maintaining standards of excellence and the integrity of the teaching/learning process, the university and its faculty also recognize that, on occasion, grades may be inappropriately assigned. Should such conflicts occur, students have a right to be fairly heard. When discrepancies occur concerning the grading process, the welfare and integrity of both faculty and students are equally important. This document is in no way intended to compromise the work of the faculty.

The faculty member (or members, in the case of a jointly taught course) bear the responsibility for specifying in writing at the beginning of each class section the formal requirements of the course and the weights that will be employed in determining the final course grade. The faculty member(s) shall apply relevant grading criteria uniformly to all members of the class.

Grades received through the grade review procedure are final and may not be appealed.

Initiating an appeal

When a student has evidence that a final grade has not been assigned in accordance with the stated criteria, the student shall discuss it first with the faculty member. The faculty member will explain how the final grade was determined. If the student continues to feel that the grade was incorrectly assigned, a written appeal may be submitted to the chair of the department in which the course was taught. Students appealing grades assume the burden of proof. The appeal shall state and support with all available evidence the reasons why the student believes the grade should be changed. For grades awarded for the fall semester, the written intent to appeal must be submitted no later than 14 calendar days after the beginning of the spring semester. For grades awarded for the spring semester or summer sessions, the written intent to appeal must be submitted no later than 14 calendar days after the first day of the fall semester. For schools that have a summer session or other less common sessions, school policies may specify other deadlines to ensure a timely appeal. Appeals submitted after the deadline will be heard only in exceptional cases, as determined by the appropriate vice president.

The grade issued by the faculty member shall remain in effect throughout the appeal procedure. In instances in which the failing grade is in a prerequisite course in which safety or well-being of clients, patients or the public is involved, the student shall not be allowed to enroll in the subsequent courses in which safety and well-being may be at issue until and unless the appeal is resolved in the student's favor. In these cases, the student who wishes to appeal is advised to do so as soon as possible and it is the responsibility of the school to move the appeal process expeditiously.

Mediation

The chair of the department shall attempt to mediate an amicable solution within two weeks of receipt of the written appeal. If the complaint is not resolved, the chair shall forward the student's appeal to the dean (or appropriate associate/assistant dean)[1] of the school in which the course was taught. The chair also shall submit to the dean in writing the recommendation made to the two parties regarding the appropriateness of the grade. If the grade being appealed was assigned by the chair of the department, the dean shall assume the mediation responsibility. If the grade being appealed was assigned by the dean, the mediation responsibility will fall to the appropriate vice president.

[1]In instances in which the dean of the school chooses for the appropriate associate/assistant dean to manage the grade appeal, the term "associate/assistant dean" may be substituted for the term "dean" throughout this document.

Grade review committee

The dean shall form a grade review committee and designate the chair. The committee has the option of either raising the grade or leaving the grade unchanged.

The committee shall consist of one nonvoting faculty chair, two faculty members and two students selected by the dean from disciplines whose methods and techniques of teaching and testing are as similar as possible to those of the discipline of the course in question. If the course is multidisciplinary and the instructor(s) whose grade is being appealed does not belong administratively in the school in which the course was taught, the committee shall have at least one of the faculty members from the instructor's school.

Either party may challenge the committee's membership for cause within a week of being informed of the membership. The dean shall determine if there is sufficient cause to remove the challenged committee member.

The committee shall meet initially to examine the written appeal and the department chair's recommendation. It can require the faculty member(s) to turn over to the committee grade records for that class or section and any tests, papers and examinations by students of that class that they may possess. The committee may require the student bringing the

appeal to turn over all tests, papers or other evaluations that have been returned and all existing evidence that an improper grade was awarded. The committee shall disregard any claim that a test or paper that has been returned to a student was unjustly graded unless that test or paper is produced for the committee's inspection.

After examining the materials, the committee may, by a majority vote, decline to hear an appeal that it judges to be patently without merit. Otherwise, the committee will authorize its chair to arrange a date for a hearing. The chair of the committee shall meet with each party prior to the hearing to explain the rules and procedures of the hearing.

Grade review hearing

Grade appeal hearings will be open, closed or partially open (i.e., a few close associates of each party may attend) by agreement of the appealing student and the faculty member(s) and the chair of the committee of the appealing student. In case of disagreement, the committee shall decide. The chair has the option to declare closed an open or partially open hearing in cases of disruption or in order to ensure necessary confidentiality.

Both parties may have with them an adviser of their choice (who may not be an attorney), with whom they may consult but who will not participate in the questioning of witnesses and presentation of evidence unless the opposing party and chair agree to it. The committee shall ask any member of the VCU community whose testimony it deems relevant to be available at an agreed-upon time to give testimony.

Either party may present additional witnesses as long as they remain within their allotted time and their testimony is directly relevant to the course at issue. Performance in other courses is not relevant. Witnesses other than the appealing student and the faculty member(s) shall be excluded from the hearing except when testifying. A hearing shall begin with the student outlining the reasons for the appeal and all evidence that exists of an improper grade. The faculty member(s) shall then explain the criteria used for the original grade assigned. Each party will have a time period not to exceed two hours in which to present a position.

The committee shall determine in executive session whether the grade was justified according to the course in which the grade was given. If the evidence is that the grade was determined according to the stated objectives, criteria and grading procedures of the course, the committee shall uphold the grade. The committee should also take into account that purposes, methods, requirements and grading criteria differ from course to course and that difference is a legitimate characteristic of a university and its faculty. Further, the grade in some courses may be partly or solely determined by a faculty member's professional judgment, which in itself cannot be overturned without evidence that the judgment was arbitrarily or capriciously rendered. The committee shall consider (a) whether the faculty member(s) articulated the criteria to be used (some criteria may be implicit within the discipline), (b) whether those criteria were actually used to determine the final grade and (c) whether the results of the evaluation were communicated to the student.

No grade may be changed except by a vote of at least three out of four voting members. When the committee has reached a decision, the committee chair shall submit to the dean in writing the decision and the reasons for it. The dean shall communicate in writing the decision of the committee to the appealing student, faculty member(s) and the department chair. If the grade has been changed, the dean also shall notify the registrar.

The evidence, proceedings and the final decision of the committee shall remain confidential. All documents shall be held in a confidential file by the dean for one year. The party from whom a document was obtained may request that it be returned at the end of the year. All documentation not returned shall be destroyed by the dean one year later.

Approved by the University Assembly Dec. 3, 1981.
Effective Feb. 15, 1982.
Revised September 1996. Effective Aug. 15, 1997.

Please note: Any student who has questions about initiating an appeal using the grade review procedure should call the office of the dean of his or her school or college.

VCU Honor System

VCU recognizes that honesty, truth and integrity are values central to its mission as an institution of higher education. Therefore, all students are subject to the **VCU Honor System**. All VCU students are responsible for being familiar with provisions of this document.

Academic dishonesty is the giving, taking or presenting of information or material by students with the intent of unethically or fraudulently aiding themselves or others on any work that is to be considered in the determination of a grade or the completion of academic requirements. Students in doubt regarding any matter related to the standards of academic integrity in a given course or on a given assignment should consult with the faculty member responsible for the course before presenting the work.

Consumer information

The federal Higher Education Act of 1965, as amended, requires that institutions of higher education disclose certain consumer information to current students, prospective students, current employees and/or prospective employees. This consumer information can be found on the Office of Planning and Decision Support website (http://www.opds.vcu.edu/consumer-info) and includes information about:

- Financial aid
- General information about VCU
- Student Right-to-know Act – completion and graduation rates for general student body and student athletes
- Equity in Athletics Disclosure Act – athletically related expenses and student aid
- Drug and alcohol abuse prevention
- Campus security
- Family Educational Rights and Privacy Act – student rights with respect to educational records

Paper copies of all of the information listed on the consumer information website are available upon request.

Immunization requirements

The Code of Virginia and VCU require that all full-time students submit validated immunization records to University Student Health Services. This requirement must be completed prior to registering for a second full-time semester. Failure to meet immunization requirements will result in a hold placed on the student's second-semester registration. The hold can be removed only upon receipt of the student's documented records.

Acceptable records include the VCU Certificate of Immunization (Monroe Park Campus), the VCU Health Sciences Certificate of Immunization (only students from the schools of Allied Health Professions, Dentistry, Medicine, Nursing and Pharmacy) or an immunization record from the student's doctor's office, high school, local health department, previous university/college or the U.S. military.

Students who cannot provide documented evidence of all required immunizations must see their health care provider, health department or USHS to complete all requirements.

Students are encouraged to use the online system to submit immunization records. Students should complete an electronic Certificate of Immunization and upload supporting documentation through the USHS web portal. See the USHS website (https://health.students.vcu.edu/immunizations) for more information.

Transcripts

A transcript is a copy of the student's academic record. All official transcripts are embossed with the university seal.

Official transcripts of student academic records are issued by the Office of Records and Registration only upon the written request of the student. Due to federal privacy laws, a signature is required to release a transcript; therefore the office cannot fulfill email or telephone requests for transcripts. The request should be made at least one week before the transcript is needed. All transcripts are $5 each. Currently enrolled students can obtain unofficial copies of transcripts via eServices (https://my.vcu.edu).

An official transcript is issued only after the student has paid all university bills.

Transcript requests signed by the student may be submitted in person at the Student Services Center in Harris Hall, 1015 Floyd Ave., in Room 1100; or requests may be submitted by mail to the Office of Records and Registration, Box 842520, Richmond, VA 23284-2520. Students and recent alumni may request an official transcript and pay by credit card by logging in to eServices and following the links to "Student/Student Records."

Degree requirements

The minimum course requirements, rules of admission to degree candidacy (as appropriate to degree level), language requirements, thesis or dissertation requirements for graduate degrees, comprehensive examinations, transfer of credits and the like are specified for each program on the individual program pages on this website. Additionally, many schools, programs and departments maintain websites and publish special brochures, student manuals and program guides that may be requested from the appropriate dean or program director.

Termination of enrollment

The university reserves the right to terminate the enrollment of any student for unlawful, disorderly or immoral conduct, or for persistent failure to fulfill the purposes for which he or she was matriculated. Any students whose relations are so severed forfeit all rights and claims with respect to the institution.

In addition to dismissal for failure to comply with standards of conduct described in the Rules and Procedures of VCU (https://www.policy.vcu.edu/sites/default/files/Rules%20and%20Procedures.pdf) and the VCU Honor System (https://conduct.students.vcu.edu/vcu-honor-system), a student may be dismissed from the academic unit in which he or she is enrolled for failure to meet academic requirements prescribed by his or her academic unit or failure to exhibit the attitudes and skills deemed necessary to function within the chosen professional practice. Therefore any action by a student considered to be unprofessional conduct according to the code of ethics and the laws and regulations governing the student's chosen profession shall constitute cause for disciplinary action.

Unprofessional conduct includes, but is not limited to:

1. Fraud or deceit in gaining admission to the university, i.e., false or obviously misleading representations on the admissions application
2. An act that violates the established standards regarding conduct of one person toward society, as stated in the VCU Code of Conduct (https://acs.vcu.edu/integrity-and-compliance-office/vcu-code-of-conduct)
3. Conviction of a felony involving moral turpitude

Course information

Credit hour

A credit hour is defined as a reasonable approximation of one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately 15 weeks, or the equivalent amount of work over a different amount of time. Credit is based on at least an equivalent amount of work for other academic activities including laboratory work, internships, practica, studio work and other academic work leading to the award of credit hours and is established by individual programs. This definition represents the minimum standard. Student time commitment per credit hour may be higher in individual programs.

Course numbering system

All schools and programs within VCU use the following course numbering system. All course numbers consist of three digits (XXX). The first digit relates to the course level as follows:

0XX – Noncredit courses

Courses with these numbers are offered for students to make up deficiencies in previous training or to improve certain basic skills.

1XX and 2XX – Undergraduate, lower-level

These courses are offered primarily for undergraduate students and may not be used for graduate credit, although graduate students may be required to register for courses at this level to gain a necessary foundation for other course work.

3XX and 4XX – Undergraduate, upper-level

These courses are offered for advanced undergraduates and usually constitute the major portion of specific program work leading to the baccalaureate degree. On occasion, students will be advised by their graduate advisers to enroll in prerequisite 400-level courses. Graduate programs can require that 300- or 400-level courses be taken, but credit in these courses cannot count toward the graduate degree or in the graduate GPA.

5XX – Introductory graduate courses

Graduate students enroll for credit in these courses through the normal graduate advising system. Departments may limit the number of 500-level courses applicable to a graduate degree program. Advanced undergraduates may enroll in these courses for credit with consent of the offering department. Credit is applicable toward only one degree unless a student is admitted to a course of study that allows a defined number of shared courses.

5XX – Professional graduate courses

These first-year, first-professional (medicine, dentistry and pharmacy) courses are normally open to students enrolled in the M.D., D.D.S. and Pharm.D. programs. Certain courses of this group may be designated by the department and approved by the University Graduate Council for graduate credit.

6XX, 7XX and 8XX – Graduate courses

Graduate students enroll for credit in these courses through the normal graduate advising system. Credit is applicable toward only one degree unless a student is admitted to a course of study that allows a defined number of shared courses.

6XX and 7XX – Professional graduate courses

6XX: These second-year first-professional courses are normally open only to students enrolled in the M.D., D.D.S. and Pharm.D. programs. Certain courses of this group may be designated by the department and approved by the University Graduate Council for graduate credit.

7XX: These third- and fourth-year first-professional courses are normally open only to students enrolled in the M.D., D.D.S. and Pharm.D. programs. Certain courses of this group may be designated by the department and approved by the University Graduate Council for graduate credit.

Grading and marking system

VCU course work is measured both in terms of quantity (semester hours of credit) and quality (grades). Grades are assigned according to a letter system. Each letter is assigned a grade-point value. The scale used is known as a four-point grading system since 4.0 is the highest grade point assigned. The number of grade points earned is computed by multiplying the grade-point value for the letter grade times the number of semester credits for the course. For example, a student who receives an A (four grade points) in a three-credit course earns 12 grade points.

Grade letter	Meaning	Grade-point values per semester credit
A		4.0
B		3.0
C		2.0
D		1.0
F		0.0
FI	Incomplete changed to fail	0.0
AP	Advanced Placement	(_)
AU	Audit	(_)
CO	Continued	(_)
CR	Credit	(_)
H	Honors	(_)
HP	High Pass	(_)
I	Incomplete	(_)
IB	International Baccalaureate	(_)
IM	Incomplete Military	(_)
M	Marginal	(_)
NC	Administrative grade with no credit	(_)
NR/NG	Administrative grade assigned when no grade is submitted by the instructor	(_)
P	Pass	(_)
PR	Progress	(_)
TR	Transfer Credit	(_)
W	Withdrawn	(_)
WM	Withdrawn Military	(_)
DN	D grade excluded from GPA	(_)
FN	F grade excluded from GPA	(_)

Grades designated by a blank, (_), in the grade-point column are not considered in the computation of grade points earned or GPA.

Further explanation of grades/marks above

Grade of pass (P)

This grade is awarded for certain courses to denote satisfactory completion of requirements. The grade of P is not included in the calculation of the GPA.

Grade of progress (PR)

The mark of PR may be assigned only in courses approved for such grading. Unlike the mark of I, PR will not automatically be changed to a failing grade at the end of the succeeding semester. The grade of PR is not included in the calculation of the GPA.

Grades of satisfactory (S), unsatisfactory (U) or fail (F) in thesis and dissertation courses

All thesis and dissertation credits are to be graded each semester as satisfactory (S), unsatisfactory (U) or fail (F). There is no limit to the number of these credits a student may take while pursuing completion of the degree. Receipt of the grade of U is formal notification to the student of unsatisfactory progress. A grade of U is a permanent grade and associated credits do not count toward a degree. Future satisfactory performance following a grade of U is reflected in the assignment of the grade of S in subsequent semesters. A grade of S or U is not included in the calculation of the GPA. A student who receives a final grade of F in the thesis or dissertation will be dismissed from the graduate program. A student who receives three grades of U in a thesis/dissertation course will be dismissed from the program.

Mark of audit (AU)

Class size permitting, students may register for courses on an audit basis. Auditing a course means students enroll in a course but do not receive academic credit upon completion of the course. Students who register on an audit basis are subject to attendance regulations of that class and, unless otherwise specified, at the discretion of the instructor, are subject to the same course requirements as other students in the class.

Students who register on an audit basis may be administratively withdrawn by instructors for a violation of class requirements for audit students, before or after the normal withdrawal deadline as posted on the VCU Academic Calendar (http://academiccalendars.vcu.edu).

Audit students are charged the regular rate of tuition and fees. An audit course is counted as part of the student's semester load in terms of classification as a full-time student. Courses taken for audit, however, do not satisfy minimum enrollment requirements for students receiving graduate teaching or research assistantships, graduate fellowships or university graduate scholarships.

Students may register for audit only during add/drop and late registration periods as a new registration and not as a change from credit to audit. Changes in registration status from audit to credit or from credit to audit will not be approved after the last day of add/drop registration.

Courses assigned the AU mark will not be computed into the GPA and do not result in earned credit hours.

Mark of continued (CO)

The mark of CO may be assigned as an interim mark for those courses that run over more than one grade reporting period. The CO mark indicates the course is not expected to be completed in a single semester and that the student must re-register for the course in the following semester. Upon departmental notification, CO marks for courses not re-registered for in the following semester are converted to F grades. Upon completion of the course, a final grade is assigned for that semester and the previous CO mark(s) remain. This mark may be assigned only in courses approved for such grading. Courses assigned the CO mark will not be computed into the GPA and do not result in earned credit hours.

Mark of credit (CR)

Courses assigned the CR mark will not be computed into the GPA.

Mark of honors (H)

Courses assigned the H mark will not be computed into the GPA.

Mark of high pass (HP)

Courses assigned the HP grade will not be computed into the GPA.

Mark of incomplete (I)

When circumstances beyond a student's control prevent the student from meeting course requirements by the end of the semester, the student may request the instructor to assign the mark of I for that semester. The awarding of a mark of I requires an agreement between instructor and student as to when and how the course will be completed. Once the agreement is reached, the instructor fills out an incomplete grade assignment form bearing the student's signature; the form is submitted instead of a final course grade. A grade cannot be changed to I after the deadline for grade submissions.

The maximum time limit for submission of all course work necessary for removal of an incomplete is the end of the last day of classes of the next semester following the semester in which the incomplete was incurred (i.e., an incomplete awarded in the fall semester must be converted by the last day of classes in the spring semester, and an incomplete awarded in the spring or summer session must be converted by the last day of classes in the fall semester). At that time, an un-removed grade of incomplete is changed automatically to a failing grade. Individual departments and schools may have more stringent time limits. An extension of the time limit is possible, but must be approved, prior to the expiration date stated above, by the instructor and the dean of the school through which the course is offered. For undergraduate and professional students, written approval indicating the new time limit must be filed with the dean of the school through which the course is offered. For graduate students, written approval indicating the new time limit must be filed with the dean of the Graduate School.

Courses assigned the I mark will not be computed into the GPA.

Mark of incomplete military (IM)

See the "Military services crisis tuition relief, refund and reinstatement guidelines" in the Tuition, fees and expenses (http://bulletin.vcu.edu/undergraduate/undergraduate-study/tuition-fees-expenses) section of this bulletin. Courses assigned the IM mark will not be computed into the GPA.

Mark of marginal (M)

Courses assigned the M mark will not be computed into the GPA.

Mark of withdrawn (W)

The mark of W indicates the student has officially withdrawn from the course or has been withdrawn for a violation of the course attendance policy or nonattendance. A student who has officially withdrawn from a course or who has been administratively withdrawn for nonattendance may not attend subsequent meetings of the course.

Students should refer to any school- or course-specific policies related to withdrawal dates. The last day to withdraw for the fall and spring semesters is the end of the 10th week of classes. Summer session students should check the Summer Studies Calendar (http://www.summer.vcu.edu/calendar).

Courses assigned the W will not be computed into the GPA. For further information see the Withdrawal from the university (p. 24) entry in this section of this bulletin.

Mark of withdrawn military (WM)

Courses assigned the WM mark will not be computed into the GPA. See the "Military services crisis tuition relief, refund and reinstatement guidelines" in the Tuition, fees and expenses (http://bulletin.vcu.edu/undergraduate/undergraduate-study/tuition-fees-expenses) section of this bulletin.

Grade-point average

The GPA is computed by dividing the number of grade points earned at VCU by the number of credit hours attempted at VCU. The grades of accepted transfer courses are not included in the computation of the VCU GPA. However, transfer grades are included in the computation of laudatory graduation honors for undergraduate students.

VCU has three program levels: undergraduate, graduate and professional. Each program level has a cumulative GPA. For students who enroll in multiple programs at the same degree level, the GPA for the multiple programs will be merged. For example, a student who graduates from an undergraduate program at VCU and pursues a second undergraduate program at VCU will have one continuous GPA.

Reading the transcript

The E notation, when following a letter grade, means that the course has been repeated and the grade and earned hours are excluded from the GPA.

The A notation, when following a letter grade, means that course is duplicate credit and the grade and hours are included in the GPA, but the hours have been removed from earned hours total.

The I notation, when following a letter grade, means that the grade and earned hours are included in the GPA.

Letter grades preceded by an X are not computed in the GPA.

Grades of D or F may be assigned by the Honor Council and the grade is computed in the GPA. However, a grade of W may be assigned by the Honor Council and is not computed in the GPA. In both cases a notation will be made on the academic transcript detailing the Honor Council assignment.

Change of grade

A final grade may be corrected by the faculty member with proper submission of the change of grade form (for undergraduates) or special action form (for graduate students) to the chair of the department in which the course was taught. The chair will forward the form to the school's dean, who will send it to the Office of Records and Registration or Graduate School, as appropriate. For grades awarded in the fall semester, the change of grade must be submitted by the department chair no later than 30 calendar days after the beginning of the following spring semester. For grades awarded in the spring semester or summer, the change must be submitted no later than 30 days after the beginning of the following fall semester. However, a change of grade that affects the student's academic eligibility to enroll must be made during the add/drop period in the semester or summer session in which the student plans to continue attendance.

Evaluation and final grade reports

University policy requires faculty to provide students with feedback about their academic performance before the semester or class withdrawal date. Although such feedback does not always take the form of a letter grade, grades do provide a clear indication of class progress. Students are encouraged to discuss their progress in courses with their instructors, especially before the withdrawal deadline.

Students who do not attend class are responsible for dropping or withdrawing from class during the established dates. Exceptions to this policy are made only in rare instances. Requests for an exception should begin with a discussion with the academic adviser and must be filed with the appropriate body within three years of the semester of enrollment..

Grades and unofficial academic histories are available online through **eServices**; official transcripts may be obtained for a fee from the **Office of Records and Registration**.

Additional information about appealing grades can be found on the Grade review procedures (p. 18) page.

Posthumous degrees

Recipients of posthumous degrees should meet the following conditions:

- The student was in good academic standing at the time of his or her death.
- The degree must be awarded within three years of the last day of enrollment.
- There were no disciplinary actions pending against the student.
- The death was not a result of illegal behavior on the part of the student.
- The student earned at least 30 credits at VCU and was within the last 30 credits of graduating (if an undergraduate student).

Graduate and professional programs will determine equivalent progress of students toward their graduate or professional degrees.

A notation that the degree was awarded posthumously will be made in the commencement program and on the transcript, but not on the diploma.

University right to revocation

The university reserves the right to revoke any degree, certificate or other university recognition for cause. In addition, any time following the award of a degree, certificate or other university recognition, the university reserves the right to take appropriate action, including, but not limited to, the revocation of such degree, certificate or other university recognition, on the basis of academic misconduct discovered subsequent to, but which occurred prior to, the awarding of the degree, certificate or other university recognition. More specifically, when an action that constitutes a violation of the VCU Honor System leads to a finding that invalidates a major piece of work required for a degree, certificate or other university recognition so that the validity of the degree, certificate or other university recognition is jeopardized, the student or former student will be subject to a sanction that may include (a) rejection of a thesis, dissertation or other work, (b) revocation of a certification or other university recognition or (c) revocation of a degree.

Leave of absence

Note: This leave of absence regulation applies only to graduate and first-professional students; it does not apply to undergraduate students.

Graduate and first-professional students may request a leave of absence from a program through written appeal to their program director. The program director will forward the request to the appropriate school dean/dean designee who, following departmental governance procedures, will forward their recommendations and any supporting documentation for final approval as necessary.

Students who are out of compliance with continuous enrollment policies (see Graduate registration policies (p. 29)) and who have not been granted approved leaves of absence by the appropriate dean must reapply for admission to VCU and to their degree programs.

Graduate students with approved leaves of absence are exempted from continuous enrollment requirements for the LOA period. Students should note that while leaves of absence temporarily suspend continuous enrollment requirements, they do not extend time limits for completion of degrees. (See policy on Exceptions (p. 25).)

Leaves of absence must be requested and approved before or during the first semester of leave. Requests for retroactive leaves of absence will not be approved.

The leave of absence prevents registration for the approved leave of absence period. If the student wishes to return to academic study before the end of the approved leave of absence period, they should notify the appropriate school or college to request that the leave of absence be shortened and the registration hold removed.

Because curricular and course content changes may occur and a student's progress toward a degree may be adversely affected because of an extended absence, specific limits may be imposed by individual schools and colleges with respect to the length of time allowed for absences. Extended leaves of absence may also impact financial aid; students should consult the Office of Financial Aid to understand the

potential impact of a leave of absence. If there is a delay in return beyond the allotted time period without written consent of the dean of the school or college, the student may be required to reapply for admission.

Students on leave are eligible for reinstatement of their enrollment through the end of their approved leave period, and many students who take a leave will have no requirements attached to their reinstatement. The dean of the student's school or college may establish specific requirements for reinstatement if the circumstances of the student's departure warrant it. The goal of such conditions is to prepare the student for a successful return to the university; for example, a student may be asked to complete preapproved course work at an outside institution in order to demonstrate readiness to return to rigorous academic work or to participate in a reinstatement consultation with Student Accessibility and Educational Opportunity, University Student Health Services, or University Counseling Services, to facilitate a successful return. If the leave is health-related, any conditions or requirements for reinstatement will be based on an individualized assessment of each student, including consideration of current medical knowledge and/or the best available objective evidence of the student's ability to function academically at the university with or without accommodations. Careful consideration will be given to the opinions and recommendations of the student's treating physician or mental health professional, if available.

Withdrawal from the university

Withdrawal

Students may use **eServices** to withdraw from any or all courses before the relevant deadlines according to the **VCU Calendar**. Failure to complete this process may result in the assignment of failing grades in all or some of the courses for which the student is currently enrolled.

A mark of W (withdrawn) will be recorded on the permanent student academic record for all courses from which students withdraw. Charges are assessed and adjusted according to the university refund policy, which is published in the **Tuition, fees and expenses** section of this bulletin.

Whenever possible, students should consult their academic or program adviser prior to any withdrawals. Certain academic programs, including some health sciences programs, have specific continuance standards; students in those programs should consult their program adviser to understand how withdrawal may affect continuance in health science curricula.

Also see cancellation of registration in the level-specific registration policies sections of this Bulletin.

Medical withdrawal

A student may experience a medical or mental health condition that makes them unable to complete their studies once a semester is in progress. In these cases, the student may use **eServices** to either drop or withdraw from all courses before the relevant deadlines according to the **VCU Calendar**. Students unable to drop or withdraw using **eServices** should contact their adviser or the Student Services Center in Harris Hall on the Monroe Park Campus.

A student may request withdrawal after the withdrawal deadline only as an exception to the standard withdrawal process for health reasons. A student may petition the dean (or dean's designee) for a medical withdrawal from all courses after the withdrawal deadline but prior to the last day of classes per the academic calendar — and before a final class grade has been assigned and/or posted to the academic history.

The dean (or dean's designee), in consultation with a qualified health provider as appropriate, will determine whether a medical withdrawal from all courses is appropriate based on the circumstances of the individual request. A medical withdrawal may only be granted for all courses taken that semester. The student must present documentation of their need to withdraw. This documentation must include a letter, written on letterhead, from a qualified health care provider that establishes the dates of treatment, the diagnosis and the degree of impairment that the condition has created. This letter should also provide the date when the student became unable to attend classes, or when the impairment was considered significant enough to affect academic performance. Graduate students should submit a request to the dean of the Graduate School via the special action form process.

If the request is approved, the student's transcript will reflect a grade of W for all courses taken that semester. No special designation for medical withdrawal is made on the transcript, and tuition and fees are charged in the same manner as other withdrawals. Medical withdrawal may impact future financial aid in relation to **satisfactory academic progress** (see **university refund policy** in the financial aid section).

In the event that a student's health problem poses a danger to the student, to patients or to others with whom the student may come in contact, and the student is unable or refuses to initiate steps to withdraw as stated above, administrative withdrawal of the student may be made by the dean of the student's school or college in consultation with the senior vice provost for student affairs or designee and, as appropriate, relevant faculty and a qualified health care provider.

If an undergraduate student wishes to be withdrawn from selected courses only, or the dean (or dean's designee) denies the request, or the request is made after the last day of classes per the academic calendar, undergraduate students may petition for a retroactive withdrawal with the **Academic Regulations Appeals Committee**. Withdrawal decisions by the graduate dean are final and may not be appealed.

If a student will not be ready to return to the university for the semester following a medical withdrawal, a graduate or first professional student may request an approved leave of absence (see **leave of absence**). Undergraduate students may re-enroll during a later semester consistent with the continuous enrollment policy (http://bulletin.vcu.edu/undergraduate/undergraduate-study/admission-university/readmission-guidelines).

Effective bulletin

The bulletin for the academic year a student enters or re-enters a degree program identifies the curriculum degree requirements for that student. Students in continuous enrollment may fulfill the curriculum degree requirements of the bulletin for the year they entered VCU or choose to be subject to the curriculum degree requirements articulated in a subsequent bulletin. Subsequent bulletins can be chosen throughout a student's academic career. In either case, students must fulfill all curriculum degree requirements listed in the bulletin they choose.

A student's effective bulletin will remain in effect until the degree is awarded. Change in academic program (major, concentration, minor) will not result in a change in effective bulletin unless the student chooses to be subject to the curriculum degree requirements articulated in a subsequent bulletin.

Students readmitted to the university will fall under the bulletin in effect at the time of readmission. At the discretion of the school dean, department chair or program head, degree requirements may be waived and/or previously taken courses may be substituted for requirements in effect at the time of readmission.

Note: This policy may not apply to first-professional students.

Degree Works

Degree Works is a web-based degree audit tool that helps students and advisers monitor progress toward degree completion. It produces a report that outlines the components and requirements for a student's degree program and tracks the student's progress in completing those requirements.

The report is not intended to replace regular contact with academic/faculty advisers, but provides accurate information to assist students and advisers in making appropriate academic choices based on information in Banner, the university's student information system.

All degree requirements are based on the official curriculum as approved by the university-level curriculum committees and as published in the effective VCU Bulletin of record. While Degree Works is a self-service tool for students and advisers, it is the official means used to confirm that students have completed requirements for graduation.

Note: This policy may not apply to first-professional students.

Graduate-only regulations

Regulations presented in this section apply in particular to graduate students. Use the navigation to the left to see additional regulations that apply to all students or specifically to undergraduate students.

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the Graduate Bulletin as well as the academic regulations in individual school and department publications and on program websites; however, in all cases, the official policies and procedures of the University Graduate Council, as published on this Graduate Bulletin website and on the Graduate School website, take precedence over individual program policies and guidelines.

The archived (http://bulletin.vcu.edu/archive) copies of current and past bulletins (catalogs) reflect all policies and procedures in effect at the beginning of the stated academic year.

Students who maintain continuous enrollment are subject to the curricular requirements of the Graduate Bulletin (catalog) in effect at the time of admission, and to subsequent policy changes approved by the University Graduate Council for immediate implementation.

Students who do not maintain continuous enrollment must reapply for admission and will be subject to the requirements of the Graduate Bulletin (catalog) in effect at the time of readmission, and to subsequent policy changes approved by the University Graduate Council for immediate implementation. (See policy on exceptions (p. 25).)

Graduate students should contact the Graduate School at any time regarding questions relating to graduate study at VCU.

Revised 5/11/2010
University Graduate Council

Satisfactory academic progress

To remain in good academic standing students must continue to make satisfactory progress toward their degrees. Unsatisfactory grades and/or a GPA below 3.0 may warrant review for possible dismissal from their programs. Specifically, students may not present courses receiving less than a C for fulfilling degree requirements.

Further grounds for lack of satisfactory academic standing may include:

- Failure to secure a major adviser, failure of comprehensive exams, lack of progress on/unsuccessful defense of thesis/dissertation
- Discontinuous enrollment
- Exceeding time limit
- Honor policy violation
- Academic misconduct
- Professional misconduct

At the end of each semester, graduate faculty advisers and program directors will review the academic progress of all graduate students in their programs. The academic standing of any graduate students who receive multiple grades of C or grades of D or F will be reviewed for possible dismissal from their programs. Although the grade of U is not included in the calculation of the graduate GPA, graduate students who receive one or more grades of U will be considered for possible dismissal.

Students who have completed all minimum degree requirements but who are out of compliance with minimum graduation requirements (i.e., graduate grade-point average, 50 percent 500-/600-level course work, etc.), may be allowed, with the permission of their graduate faculty advisers, program directors, academic deans/dean designees and the Graduate School to take additional course work to meet minimum University Graduate Council graduation requirements. Requests for such actions must be processed via the special action form according to the instructions articulated in the Exceptions policy (p. 25) in this section. Students will have a maximum of one calendar year to complete such additional requirements. At the end of that time, if students are still out of compliance, they must be dismissed from the program for lack of academic progress.

Revised 5/10/2011; 5/10/2016; 10/5/2016
University Graduate Council

Exceptions to graduate policies

Exceptions to graduate policies must be approved by the dean of the Graduate School. Requests for exceptions to Graduate School policies are to be made in writing by students to their graduate advisers/program directors. The graduate advisers/program directors will forward their recommendations, along with copies of student requests and supporting documentation, to the school dean/dean's designee, who will review and approve or disapprove recommendations. Recommendations approved by the school dean/dean's designee will then be forwarded to the dean of the Graduate School, who represents the University Graduate Council.

Degree candidacy

A graduate student admitted to a program or track requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Degree candidacy requirements vary from program to program and may include but are not limited to such milestones as successful completion of all or a portion of all required didactic course work, the passing of written and/or oral comprehensive examinations, the identification of the thesis/dissertation adviser and/or committee, and/or the successful defense of the thesis/dissertation prospectus.

Upon satisfactory completion of degree candidacy requirements, the graduate student must submit a notice of admission to master's or doctoral degree candidacy form (available on the Graduate School website (http://www.graduate.vcu.edu/student/candidacy.html)) to his/her program director. The student's signature acknowledges that he/she has read and understands the policies regarding research involving human or animal subjects (Information on human and animal subjects can be found on the website of the Office of Research and Innovation (http://www.research.vcu.edu).) as well as continuous enrollment requirements (p. 29). Both the program director and the school's dean or dean's designee must sign the form to confirm the student's eligibility for admission to degree candidacy and forward it to the graduate dean for final approval and recording of admission to degree candidacy. The graduate dean will formally notify the student of admission to degree candidacy.

The degree candidacy form must be submitted **before** the student formally begins the final thesis/dissertation/research project **but no later** than the semester preceding the semester in which the student graduates. Failure to submit the degree candidacy form in a timely manner may delay graduation.

A graduate student approved for degree candidacy must register for at least one graduate credit hour at VCU each fall and spring semester until the degree is awarded. Students must be enrolled during their graduation semesters. Graduate students with approved leaves of absence are exempted from continuous enrollment requirements for the LOA period. **Students should note that while a leave of absence temporarily suspends the continuous enrollment requirement, it does not extend the time limit for completion of the degree.**

Revised 5/8/2012
University Graduate Council

Theses and dissertations

Comprehensive examinations

Comprehensive examination requirements and administration of the thesis/dissertation process vary by program and academic school. Graduate students should refer to the guidelines established by their programs regarding specific program requirements. In addition, graduate students should refer to the thesis and dissertation manual found on the Graduate School website (http://www.graduate.vcu.edu/student/thesis.html) for guidelines regarding the preparation and submission of theses and dissertations and for scheduling the final defense.

Master's degree candidates may have a thesis requirement — or its equivalent in the form of a research project, performance, exhibit or other production. In some programs, master's degree candidates may elect a non-thesis option. In such cases, the program may allow a candidate to change from the thesis to the non-thesis option, or vice versa, once. Such action requires written approval of the department head and the faculty adviser and/or the student's advisory committee.

All doctoral candidates are required to prepare dissertations and the associated additional submission requirements as articulated in the thesis and dissertation manual.

At the time of defense, a thesis or dissertation must be approved by members of a student's advisory committee with no more than one negative vote. A committee member's approval is given by signing the ETD approval form (http://graduate.vcu.edu/student/thesis.html). A disapproving committee member must also sign the approval form as a dissenting member and must provide a written dissenting opinion to be sent to the Graduate School.

Revised 5/8/2012
University Graduate Council

Electronic theses/dissertations – mandatory

Electronic theses and dissertations are digital representations of the traditional work completed by graduate students in partial fulfillment of requirements for graduate degrees. An ETD can be a simple textual document converted to a standard electronic format such as Adobe PDF or a complex combination of images and formats.

The VCU Graduate School thesis and dissertation website, as developed by the University Graduate Council and VCU Libraries, serves as a guide for the preparation of electronic graduate theses and dissertations for graduate students in all programs within the university. Information and a video tutorial are available on the VCU Libraries Research Guides website (http://guides.library.vcu.edu/etd).

Thesis/dissertation submission deadlines

All requirements for theses/dissertations must be completed by the deadline published in the Academic Calendar (http://academiccalendars.vcu.edu) of the semester in which the candidate plans to graduate, including:

- Final defense of thesis/dissertation
- ETD approval form with all approval signatures, including the graduate dean's and, if applicable, documentation of IRB or IACUC approval number
- Submission of the ETD to the VCU Scholar's Compass according to instructions in the VCU Graduate School thesis and dissertation manual (http://graduate.vcu.edu/student/thesis.html) (Candidate should confirm with adviser/program director all internal schedules for submission of copy, defense and approval.)
- Survey of Earned Doctorates (https://sed.norc.org/showRegister.do) (All doctoral students must complete the SED.) Refer to the Graduate School thesis and dissertation manual (http://graduate.vcu.edu/student/thesis.html) for further information.

Revised 5/11/2010; 5/10/2011; 12/12/2017
University Graduate Council

Grades of satisfactory (S), unsatisfactory (U) or fail (F) in thesis and dissertation courses

All thesis and dissertation credits are to be graded each semester as satisfactory (S), unsatisfactory (U) or fail (F). There is no limit to the number of these credits a student may take while pursuing completion of the degree. Receipt of the grade of U is formal notification to the student of unsatisfactory progress. A grade of U is a permanent grade and associated credits do not count toward a degree. Future satisfactory performance following a grade of U is reflected in the assignment of the grade of S in subsequent semesters. A grade of S or U is not included in the calculation of the GPA. A student who receives a final grade of F in the thesis or dissertation will be dismissed from the graduate program. A student who receives three Us in a thesis/dissertation course will be dismissed from the program.

Revised 5/10/2016
University Graduate Council

Graduate advisory committees

Graduate advisory committees shall be appointed for each master's degree candidate for whom there is a requirement to produce a thesis or its equivalent in the form of a research project, performance, exhibit or other production. The committee will coordinate and supervise the preparation of the thesis or its equivalent. The committee shall have a minimum of three faculty members, one of whom should be from a discipline other than that of the candidate. The chair of the committee will be designated as the candidate's faculty adviser. Departments/program directors will appoint advisers for master's degree candidates for whom a thesis or its equivalent is not required. Every member of the committee must hold graduate faculty or affiliate graduate faculty appointment. The chair and at least one other committee member must hold VCU graduate faculty status. It is expected that all members of the committee will be present at any thesis proposal and thesis defense. In the event that a single member of the committee is unable to attend, the committee may meet with the written approval of the graduate program director. If more than one member of the committee is unable to attend, the defense must be rescheduled. The chair must be present for the defense of a thesis proposal and the final thesis.

A graduate dissertation committee shall be appointed for each doctoral candidate. The committee will have a minimum of four faculty members, including a chair, who will serve as the candidate's faculty adviser. At least two members must be from within the candidate's discipline and at least one from another discipline. Every member of the committee must hold graduate faculty or affiliate graduate faculty appointment. The chair and at least two other committee members must hold VCU graduate faculty status. It is expected that all members of the committee will be present at the dissertation proposal and dissertation defense. In the event that a single member of the committee is unable to attend, the committee may meet with the written approval of the graduate program director. If more than one member of the committee is unable to attend, the defense must be rescheduled. The chair must be present for the defense of a dissertation proposal and the dissertation defense.

Upon satisfactory completion of all program requirements for admission to candidacy, doctoral matriculants will take written and/or oral comprehensive examinations administered by their major departments or schools. Successful completion of the examinations shall entitle students to advance to doctoral degree candidacy status. Candidates are then allowed to proceed with the research and preparation of their dissertations and any other doctoral degree requirements designated by their departments.

In the event of failure, students may be permitted to retake comprehensive examinations one time only. The re-examination requires the approval of the appropriate graduate program committee.

Revised 5/14/2013
University Graduate Council

Graduate faculty roles and responsibilities

VCU Graduate School Bylaws articulate eligibility criteria for membership on the graduate faculty and provisions for affiliate graduate faculty appointments. All members of a graduate advisory or thesis or dissertation committee must be a member of the graduate faculty or hold an appointment as an affiliate graduate faculty member. All graduate faculty may chair thesis committees; however, only graduate faculty holding the Ph.D. or equivalent degree may chair a dissertation committee. An affiliate graduate faculty member may advise and serve, but not chair, thesis or dissertation committees.

Appointment to affiliate graduate faculty status must clearly articulate the roles and responsibilities and the duration of the appointment. Appointment for purposes of serving on a graduate advisory or thesis and dissertation committee authorizes the affiliate graduate faculty member to fully participate in all activities defined for the group by the individual program guidelines, except for chairing the committee. If the administration and evaluation of comprehensive examinations is explicitly articulated as a responsibility of the graduate advisory or thesis or dissertation committee, then any affiliate graduate faculty appointed to the committee may administer and evaluate the comprehensive examination. If comprehensive examinations are administered and evaluated by a different committee, then any affiliate graduate faculty member appointed to the committee may administer and evaluate the comprehensive examination only if such a responsibility is articulated clearly in the recommendation for affiliate graduate faculty membership by the academic school dean and approved by the graduate dean.

Revised 5/10/2011
University Graduate Council

Transfer credit for graduate students

A maximum of 50 percent of the didactic hours required for a graduate degree or any graduate certificate program may be transferred from another institution and, if not applied previously toward another degree, may be applied toward a degree. Prerequisite course work that does not count toward the VCU degree may not be transferred.

Grades for course work taken at VCU, either as a nondegree-seeking student or in a previous graduate matriculation for which a degree was never awarded, are included in the calculation of the VCU graduate grade-point average and all other graduate statistics. Grades for course work taken at another institution are not recorded on the VCU transcript (only the names of courses, source institutions and credit hours) and are not included in the calculation of the VCU graduate grade-point average and other graduate statistics.

Recommendations regarding transfer credit are initiated at the program and academic school levels and reviewed and approved by the Graduate School. All matriculated students must obtain final written approval from the Graduate School for course work approved for transfer **before** registering for course work at another institution. Individual schools/

programs may have more stringent requirements. Requests for transfer of course work must include an official copy of the transcript from the college or university where the course work was taken and a VCU Graduate School transfer equivalency form.

Graduate credit hours earned toward a VCU certificate may be applied one time to degree requirements for master's or Ph.D. programs. Graduate credit hours earned toward a VCU certificate may be applied toward only one certificate. The determination of the acceptability of specific courses to be used for both the certificate and the graduate degree will be the responsibility of that master's or Ph.D. program or school.

All transfer work must be at the A or B grade level from a regionally accredited college or university. "Credit" or "pass" grades can be accepted only if approved by petitioning the graduate advisory committee or equivalent of the student's school or college. Students must be in good standing both at VCU and at the institutions from which the credits were earned. Some programs will not accept credits earned as a nondegree-seeking graduate student for transfer. VCU will not accept credits that do not apply to a graduate degree at the offering institution for transfer, nor will it accept credits from unaccredited institutions for transfer. These criteria apply to all domestic and international institutions.

Course work taken under the auspices of any study abroad program, including the study abroad program at VCU, is classified as course work taken at an international institution for purposes of determining if the course work may count toward a VCU graduate degree. Registration for such course work does not guarantee that the course work will count toward a VCU graduate degree. All study abroad graduate course work is subject to the same review and approval process if the course work is to count toward a VCU graduate degree.

Revised 5/11/2010; 5/10/2011 5/10/2016
University Graduate Council

Credit for military service, career or life experience

The Graduate School does not grant graduate-level credit for any type of military service or career or life experience.

The Graduate School may grant credit for formal military service school graduate-level courses that have received positive recommendation by the Commission on Accreditation of Service Experiences of the American Council on Education as stated in the ACE's "Guide to the Evaluation of Educational Experiences in the Armed Services." (http://www.acenet.edu/news-room/Pages/Military-Guide-Online.aspx) Recommendations regarding the transfer of military course work are initiated at the program and academic school levels and reviewed and approved by the Graduate School and must meet all other criteria for transfer credit as articulated in the transfer credit policy.

Revised 5/10/2011; 5/14/2013
University Graduate Council

Laudatory honors and remedial work

Graduate students are not designated as special honors graduates (i.e., cum laude, magna cum laude, summa cum laude) on transcripts or diplomas upon completion of their programs.

No degree credit for remedial work shall be awarded to graduate students. Graduate students advised to take any level course for remedial work should be notified in writing that the course credit shall not apply to the degrees they are pursuing. Other bodies may rule later, should students wish to apply the credit to some other degree.

Change of graduate program

Students who wish to change to a different graduate degree must submit a new application to the new program with all materials required of applicants to that program. The dean of the Graduate School will work with the administrators of the two programs to facilitate the admission process for eligible students.

Revised 5/10/2016
University Graduate Council

Dismissal from a graduate program and appeal process

In addition to those standards of conduct described in VCU Rules and Procedures and the VCU Honor System, graduate students enrolled at the university may be dismissed from the academic programs in which they are enrolled for failure to meet prescribed academic program requirements. Students appealing dismissal from their graduate degree programs should first pursue appeals at the program/department and/or the school level. After receiving the program/department and/or school decision, students have the option of filing an appeal with the graduate dean in the process outlined below.

Dismissal process

1. Dismissal is initiated at the program/department level by advisers/graduate program directors/department chairs via a special action form indicating the reason with relevant documentation attached. Reasons for dismissal may include but are not limited to:
    - Academic (D or F in class, too many grades of C or U, as determined by the student's academic program in conjunction with Graduate Council policy, GPA below 3.0, failure to secure a major adviser, failure of comprehensive exams, lack of progress on/unsuccessful defense of thesis/dissertation)
    - Discontinuous enrollment
    - Exceeding time limit
    - Honor policy violation
    - Academic misconduct
    - Professional misconduct
2. Request for dismissal is forwarded to the school dean/dean's designee, who reviews the action, signs the form and forwards it to the graduate dean within 10 business days.
3. The graduate dean/dean's designee reviews the action, signs the form, notifies the Office of Records and Registration and sends a dismissal letter to the student via official VCU email. This letter must include a statement of the student's right to appeal and inform the student that appeals must be initiated at the program/department and/or school level within 10 business days after receipt of the letter.

Appeal process

Preamble

Virginia Commonwealth University, through its Graduate School, defines minimum standards for admission and sets general rules governing eligibility for continuation. However, the individual graduate programs, through their respective graduate faculty and graduate program procedures, exercise principal responsibility for evaluating graduate student work. It is assumed that most disputes over evidence of unsatisfactory progress will be reconciled through discussions between faculty and students at the school/department/program level.

It is important that each graduate student be fully informed, not only of the VCU Graduate School policies and procedures, but also of any additional departmental program requirements beyond those established by the Graduate School. A copy of each departmental graduate policy statement should be readily available to all graduate students. The department should inform graduate students of degree requirements and associated school/program/department procedures at the time of matriculation.

A student may appeal dismissal from a graduate program under the following procedures.

1. The student has the burden of proof in all appeals.
2. The student must initiate the appeal process at the program level within 10 business days after receipt of the graduate dean's dismissal letter and according to the program/department and/or schools/colleges appeal processes. All program/department and/or school/college appeal processes should be exhausted prior to initiating an appeal to the graduate dean.
3. If all program/department and/or school/college appeal processes fail to resolve the issue, the student must provide the graduate dean with written notification of appeal, to include justification and all supporting documentation (correspondence and other paperwork leading up to the dismissal), within 10 business days of the school/college decision. All documentation must be provided at the time of written notification of appeal.
4. The graduate dean provides the graduate program director and school/college dean with copies of the student's appeal and asks the graduate program director/dean/department chair to provide the Graduate School with their response, including copies of correspondence and any other supporting documentation that led to the dismissal. The graduate program director and school dean must respond to the graduate dean's request for information within 10 business days.
5. The graduate dean will review the materials and may refer the matter to the admissions and academic standards committee of the University Graduate Council. The committee is composed of faculty members from various divisions of the university plus one ex-officio voting member from the Graduate School. AAS members who have direct knowledge of the student's case will be recused. A minimum of four members must be present to constitute a quorum. The committee will convene to review the documentation and consider the positions of the parties. At its meeting, the committee will hear presentations from and ask questions of the student and representatives of the school/department/program. The student and the school/department /program representative may each bring up to two persons who may provide support and advice but who may not speak for the parties.
6. After considering the materials submitted and the presentations by the parties, the committee will convene in closed session and decide, by majority vote, whether to recommend that the graduate dean uphold or reverse the dismissal. In the event of a less than unanimous decision, both opinions will be communicated to the graduate dean. The graduate dean renders the final decision and notifies the student in writing within 10 business days by certified mail to the student's official address on file with the university.
7. The student may be allowed to register for courses during the pendency of the appeal, understanding that he/she will be dropped retroactively if the dismissal is upheld.

Revised 5/11/2010; 5/8/2012; 5/13/2014; 5/10/2016
University Graduate Council

Time limit for completion

The time limit for a graduate degree will not extend beyond a period of six years for graduate certificates and master's degrees and eight years for doctoral degrees.

Course work completed before matriculation and applied toward the degree, including course work at VCU and that transferred from other institutions, will be evaluated by the program/department to determine whether it can be used to fulfill degree requirements. For course work that was taken more than eight years prior to the completion of the VCU degree, the program/department will evaluate the course work for acceptability and report those courses deemed acceptable to the dean of the Graduate School. (See policy on Exceptions (p. 25).)

Revised 5/11/2010; 5/10/2011
University Graduate Council

Repeated courses

If a graduate student repeats a course, both the original grade and the repeat grade shall be included in the calculation of the graduate GPA.

Revised 5/14/2013
University Graduate Council

Graduate registration policies

Enrollment

Any person engaged in graduate study at VCU must enroll each semester in which he/she is engaged in any form of study at VCU that involves use of university facilities, laboratories/studios and/or libraries, or who is supervised by or consults with a faculty member concerning graduate work on a project, work of art, thesis or dissertation.

Continuous enrollment for degree-seeking graduate students

Continuous enrollment – Pre-candidate

Once admitted to a degree program, a graduate student is expected to comply with minimum enrollment of one course per 12-month period from the beginning of his/her program.

Continuous enrollment – Candidate

A graduate student who has completed course requirements for a degree must register for at least one credit at VCU each fall and spring semester until the degree is awarded. Students must be enrolled during their graduation semester.

Revised 5/8/2012
University Graduate Council

Student load

Student load is the total number of credits for which students are enrolled in any semester. Students may be either full-time or part-time, dependent upon program rules. Students who are fully funded as VCU graduate assistants with tuition remission are classified as "full-time" during any semester in which they enroll for nine or more credits (three during the summer if funded on a 12-month stipend). Departmental requirements vary; therefore, funded students should verify expected course loads with their graduate program directors.

The maximum number of credits for which students may enroll in any semester without special permission is 15. More than 15 credits is an overload. More than 15 credits may result in increased tuition. Permission to enroll for more than 15 credits may be granted upon the written recommendation of the adviser, through departmental governance procedures, to the dean of the Graduate School.

Each summer course is designed to provide the equivalent of one semester's work. With careful scheduling, it is possible for students to earn as many as 15 credits during the summer if course work extends over the full summer semester calendar. Permission to enroll for more than 15 credits in the summer semester may be granted upon the written recommendation of the adviser through departmental governing procedures to the dean of the Graduate School.

Summer success is predicted on the academic standard of one credit per week. Six credits in five weeks or nine credits in eight weeks is considered a normal load, but VCU does not permit six credits in four weeks or nine credits in six weeks. Suggested summer scheduling combinations are in the online Schedule of Classes (https://pubapps.vcu.edu/scheduleofclasses).

Graduate courses are not offered during the winter intersession.

Revised 5/11/2010; 5/10/2011
University Graduate Council

Change in registration

Once students have registered for classes, changes in registration must be made during the add/drop period. Whenever students make any changes in registration, they should keep copies of their new schedules as verification of the changes. Changes in registration may affect financial aid. Students are advised to consult with a financial aid counselor before making any changes to their enrollment status. See the Financing graduate school (p. 37) section of the Graduate Bulletin for detailed information.

Cancellation of registration

To cancel registration, students must notify, in writing, the Office of Records and Registration before the end of the add/drop period, or drop all classes using the Web registration system. Refunds are issued in accordance with procedures described in the Financing graduate school (p. 37) section of the Graduate Bulletin.

Auditing graduate classes

Class size permitting, students may register for courses on an audit basis. Auditing a course means students enroll in courses, but do not receive academic credit upon completion of the courses. Students who register on an audit basis are subject to attendance regulations of that class and, unless otherwise specified at the discretion of the instructor, are subject to the same course requirements as other students in the class. Students who register on an audit basis may be administratively withdrawn by instructors for a violation of class requirements for audit students, before or after the normal withdrawal deadline as posted on the VCU Academic Calendar (http://www.vcu.edu/academiccalendars). Audit students are charged the regular rate of tuition and fees. An audit course is counted as part of a student's semester load in terms of classification as a full-time student. Courses taken for audit, however, do not satisfy minimum enrollment requirements for students receiving graduate teaching or research assistantships, graduate fellowships or university graduate scholarships. Students may register for audit only during add/drop and late registration periods as a new registration and not as a change from credit to audit. Changes in registration status from audit to credit or from credit to audit will not be approved after the last day of add/drop registration. The grade of AU is not included in the calculation of the GPA.

Revised 5/11/2010
University Graduate Council

Withdrawal from a graduate program

Graduate students in good academic standing, according to the academic rules and regulations articulated in the Graduate Bulletin and by individual graduate programs, may request to withdraw from a graduate program at any time. Students should notify their graduate program directors as soon as possible of the intent to withdraw from the program. The program director will then notify the Graduate School via the special action form procedure. The effective term of withdrawal is recorded as the end of the last term of active registration.

Withdrawal from a program does not constitute a withdrawal from course work. Students who wish to also withdraw from classes should do so according to the procedures on the Course drop vs. withdrawal page (p. 17) of the universitywide academic regulations.

Students who are not in good academic standing should be reviewed for possible dismissal from their academic programs as prescribed elsewhere in this section (see Dismissal from a graduate program and appeal process (p. 28)).

Revised 5/8/2012
University Graduate Council

Graduate degree requirements

The minimum course requirements, rules of admission to degree candidacy, language requirements, thesis or dissertation requirements, comprehensive examinations, transfer of credits and the like are specified for each graduate program in the individual pages on this website. Additionally, many schools, programs and departments maintain websites and publish special brochures, student manuals and program

guides that may be requested from the appropriate dean or program director.

In all cases, the official policies and procedures of the University Graduate Council, as published in the Graduate Bulletin and on the Graduate School website, are fully applicable to all graduate programs and graduate students, both on- and off-campus, and take precedence over individual program policies and guidelines. Graduate students should contact the Graduate School with questions regarding any discrepancies.

Graduate advising and student responsibilities

Students are responsible for the proper completion of their academic programs. They must be familiar with the Graduate Bulletin as well as all additional academic regulations promulgated by individual schools and departments.

The offices of the deans and department chairs, in cooperation with the advisers and faculty, endeavor to follow the academic progress of all students, and students are encouraged to seek counsel whenever there is a need. If advisers are unable to resolve problems satisfactorily, they will refer students to others as deemed appropriate and necessary.

In order to aid advising, students are responsible for maintaining current mailing addresses on file with the Office of Records and Registration (http://rar.vcu.edu), as well as with the schools and departments in which they are enrolled.

Students also are required to obtain an official VCU student email account within one week of the beginning of the first semester of enrollment and are responsible for reading in a timely fashion university-related communications sent to their official VCU student email accounts. Information on how to set up an email account (http://mymail.vcu.edu) is available online.

The academic advising process requires periodic checks by graduate students, advisers and program directors to ensure the accuracy of students' academic histories. Unofficial academic histories are available online through eServices (http://www.eservices.vcu.edu), or official transcripts may be obtained for a fee from the Office of Records and Registration (http://rar.vcu.edu).

It is the responsibility of all graduate students to:

1. Check their records no later than the end of the add/drop registration period at the beginning of each semester to ensure that their registrations are correct
2. Check their records at the end of each semester to ensure that their academic histories are current and correct

Students who wish to appeal assigned grades must follow the grade review procedure (p. 18) as articulated in this Bulletin and as published in VCU Rules and Procedures (http://policy.vcu.edu) in the VCU Policy Library.

Requests for any other changes to an academic history must be submitted in writing by students to their graduate program directors no later than 14 calendar days after the beginning of the following semester (for the fall semester, 14 calendar days after the beginning of the spring semester; for the spring or summer semester, 14 calendar days after the beginning of the fall semester).

Graduate students, program directors and academic school deans/designees are required to conduct a final review of all academic histories as part of the application-to-graduate check-out process as articulated in Graduation information (p. 31) section of this Bulletin as well as on the Graduate School website. A student's signature on or submission of the application to graduate is acknowledgement that the student has reviewed the academic history and that it is correct. Final approval by graduate program directors and academic school deans/designees of the application to graduate confirms that the student's academic history is complete, correct and final and that no future requests for changes to the academic history will be considered once the student has been approved to graduate.

Revised 5/11/2010
University Graduate Council

Graduation information

All degrees are conferred by the VCU Board of Visitors upon recommendation of the graduate faculty.

Candidates for degrees are eligible for graduation upon completion of all academic requirements in effect at the time of official matriculation into the program, provided the students are continuously enrolled and provided the requirements are met within the time limit specified by the school or program and the University Graduate Council. Students failing to satisfy the time requirement and who are readmitted to their programs shall satisfy requirements in effect at the time of readmission.

Degrees are granted at the close of the semester or summer session in which students complete their work. Degrees will not be granted unless all financial obligations have been resolved with VCU's Student Accounting Department. Students must be enrolled at the time of application (i.e., the semester in which students graduate).

No degrees will be conferred unless students make formal application to graduate.

Degrees will be awarded and diplomas issued in a current semester only. Students who do not submit/complete their applications to graduate in the semester in which they actually complete their programs will be awarded their degrees in the semester in which they apply to graduate. In such cases, a text notation will be added to the transcript to indicate the date that course work for the degree was completed. Program directors and academic school deans must submit a special action request to the Graduate School to this effect that also includes a request for a waiver of the requirement that the students must be enrolled at the time of application/reapplication. A request for a waiver of the enrollment requirement must document that the student has completed all degree requirements and is not using any university resources (i.e., libraries, computer labs, faculty advising, etc.)

Graduation applications must be submitted by students to their advisers or deans no later than the dates indicated in the university's academic calendars (http://academiccalendars.vcu.edu) on the Web. Students should schedule conferences with their advisers well ahead of the deadline and should note that the application requires the approval of the adviser, the department chair or the school director of graduate studies, and the school dean. **Credit is applicable toward only one degree unless students are admitted to a course of study that allows a defined number of shared courses. Graduate credit hours earned toward a VCU graduate certificate may be applied one time to degree requirements for master's or Ph.D. programs. Graduate credit hours earned toward a VCU graduate**

certificate may be applied toward only one certificate. The determination of the acceptability of specific courses to be used for both the certificate and the graduate degree will be the responsibility of that master's or Ph.D. program or school.

Revised 5/11/2010, 1/24/2017
University Graduate Council

Graduation checklist

The total number of semester credits required for graduation depends upon the degree program. Specific information may be found under degree program descriptions. In addition to the specific requirements listed by the department, the following graduation checklist for graduate students, advisers and program directors summarizes all general requirements for graduation as determined by the University Graduate Council.

- All provisional or probationary conditions of admission have been met
- Candidates enrolled at time of application/reapplication to graduate (i.e., semester in which candidates plan to graduate)
- Overall graduate GPA is greater than or equal to 3.0
- Graduate GPA based on all graduate course work attempted after acceptance into program
- For repeated courses, both original grade and repeat grades included in calculation of graduate GPA
- Students may not present courses receiving grades less than C for fulfilling degree requirements. Individual programs reserve the right to establish more stringent requirements regarding acceptance of C grades.
- No course work approved for transfer below grade of B; no course work approved for transfer included in calculation of GPA
- Graduate course work only (500 level or higher) may be applied to a graduate degree, with at least one-half of required course work designated exclusively for graduate students (600 or higher)
- All Incompletes (I) converted to letter grade by last day of class of semester in which candidate plans to graduate
- All grades of Continued (CO), Progress (PR) and No Grade (NG) converted to letter grades by last day of class of semester in which candidate plans to graduate
- All course work taken within prescribed time limits (master's, six years; Ph.D., eight years, with any extensions approved by Graduate School)
- All requirements for theses/dissertations must be completed by the deadline published in the academic calendar (http://academiccalendars.vcu.edu) of the semester in which the candidate plans to graduate, including:
  - Final defense of thesis/dissertation
  - ETD approval form with all approval signatures, including the graduate dean's and, if applicable, documentation of IRB or IACUC approval number
  - Submission of the ETD to the VCU Scholar's Compass (http://scholarscompass.vcu.edu) according to instructions in the VCU Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/student/thesis.html) (Candidate should confirm with adviser/program director all internal schedules for submission of copy, defense and approval.)
  - Survey of Earned Doctorates (https://sed.norc.org/survey) (All doctoral students must complete the SED.) Refer to the Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/student/thesis.html) for further information.)
- Students must settle all financial obligations with VCU's Student Accounting Department.

Revised 5/11/2010; 5/10/2011; 12/13/2016
University Graduate Council

Application to graduate

At the beginning of each semester, all matriculated graduate students will receive an email reminder from the Office of Records and Registration/Graduation Office to initiate the application-to-graduate process for the current semester. The email notification will be sent to the official VCU student email address and will include submission deadlines and guidelines. (All graduate students in the School of Medicine are asked to complete a preliminary review before initiating the graduation process and are referred to the School of Medicine guidelines or to their advisers/graduate program directors regarding application-to-graduate procedures.) Students planning to graduate in the current semester should proceed as follows:

- Complete the apply to graduate procedure on eServices. The VCU application to graduate will be provided during this process.
- Complete the VCU application to graduate according to the instructions provided. A separate application to graduate is required for each program from which the student intends to graduate.

Graduate students, program directors and academic school deans/designees are required to conduct a final review of all academic histories as part of the application-to-graduate check-out process as articulated in this Bulletin and on the Graduate School website (http://graduate.vcu.edu/student/graduation.html)**. A student's signature on the application to graduate is acknowledgement that the student has reviewed the academic history and that it is correct. Final approval signatures by graduate program directors and academic school deans/designees on the final application to graduate confirm that the student's academic history is complete, correct and final and that no future requests for changes to the academic history will be considered once the student has been approved to graduate.**

Revised 5/11/2010; 5/10/2016
University Graduate Council

Reapplying for graduation

Candidates who do not graduate at the end of the semester for which they have applied must re-register and reapply. Students must be enrolled at the time of application/reapplication (i.e., the semester in which the student graduates).

Commencement participation

Graduate students are encouraged to visit the Graduate School website (http://www.graduate.vcu.edu/student/graduation.html) for information about university Graduate School events and activities for May and December commencement ceremonies. Students also are encouraged to visit the VCU Commencement website (http://www.vcu.edu/commencement).

GRADUATE STUDY

Graduate programs are administered by the individual departments, schools and centers with assistance from the Graduate School. Major coordination of the various degree programs is performed by the University Graduate Council, which is chaired by the dean of the Graduate School. The University Graduate Council comprises two elected faculty members from each school and one elected faculty member from VCU Life Sciences.

The Graduate School section of the VCU Bulletins documents the official admission and academic rules and regulations that govern graduate education at the university. The University Graduate Council determines these policies.

Bulletins and course descriptions for the current and past years are now archived in the VCU Scholars Compass (http://scholarscompass.vcu.edu/vcubulletins) hosted by the VCU Libraries.

Graduate programs

In-depth descriptions of all graduate programs at VCU are provided in the individual school and program sections of this bulletin. The Graduate School website (http://www.graduate.vcu.edu) provides links and contact information for all graduate programs offered at VCU. The website also provides updates that occur throughout the academic year, as well as the Application to Graduate Study and complete instructions for applying to all graduate programs.

Refer to the program index for a complete listing of all graduate programs, as well as application deadline dates, and special admission requirements and contact information. Applicants are encouraged to contact the school/department sponsoring the intended program of study at the telephone numbers and/or email addresses provided. Other important contact information is provided on the Graduate School (http://www.vcu.edu/graduate) website as well.

Welcome from the graduate dean

Important information for all graduate students

On behalf of the graduate faculty, I welcome you to graduate study at Virginia Commonwealth University. At VCU you will find a comprehensive array of academic programs, outstanding faculty and a supportive environment conducive to graduate study and research. The university offers nationally and internationally acclaimed graduate and research programs that meet the many needs of the commonwealth of Virginia, the United States and the world.

The University Graduate Council, chaired by the dean of the Graduate School, provides academic and administrative oversight and coordination of all graduate programs in accordance with the Graduate School's mission: to provide leadership in all matters relating to graduate education at Virginia Commonwealth University in order to create a stimulating environment for teaching, learning, research, creative expression and public service. Academic departments and schools administer individual graduate degree programs with the assistance and support of the VCU Graduate School. In-depth descriptions of all graduate programs at VCU are provided in the individual school and program sections of this bulletin.

VCU Graduate Bulletin

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the Graduate Bulletin as well as the academic regulations in individual school and department publications and on program websites; however, in all cases, the official policies and procedures of the University Graduate Council, as published on this Graduate Bulletin website and on the Graduate School website, take precedence over individual program policies and guidelines.

Bulletins and course descriptions for the current and past years are now archived in the VCU Scholars Compass (http://scholarscompass.vcu.edu/vcubulletins) hosted by the VCU Libraries.

Students who maintain continuous enrollment are subject to the curricular requirements of the bulletin in effect at the time of admission and to subsequent policy changes approved by the University Graduate Council for immediate implementation.

Students who do not maintain continuous enrollment must reapply for admission and will be subject to the requirements of the bulletin in effect at the time of readmission and to subsequent policy changes approved by the University Graduate Council for immediate implementation. (See policy on exceptions (p. 25).)

Graduate students should contact the Graduate School at any time regarding questions relating to graduate study at VCU.

I commend you for your decision to pursue graduate study, and I wish you every success in the pursuit of your educational goals at Virginia Commonwealth University.

Sincerely,

F. Douglas Boudinot
Dean of the Graduate School

Revised 5/11/2010
University Graduate Council

Administration and contact information

Blair House
408 West Franklin Street
Box 843051
Richmond, Virginia 23284-3051
Phone: (804) 828-2233
Fax (804) 827-0724
Email: gradschool@vcu.edu
graduate.vcu.edu (http://graduate.vcu.edu)

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Phone: (804) 828-2233
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Phone: (804) 827-4551
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Coordinator, strategic analytics and communications
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Email: taylorjl25@vcu.edu (tennisonj@vcu.edu)

Jennifer Tennison
Coordinator, enrolled student services
Phone: (804) 827-4546
Email: tennisonj@vcu.edu

Admission to graduate study

The Board of Visitors, the administration and the faculty of VCU are committed to a policy of equal opportunity in education and employment without regard to age, race, color, national origin, gender, religion, sexual orientation, veteran's status, political affiliation or disability.

Admission requirements

Minimum admission requirements for graduate study at VCU are outlined below. Individual departments and programs may set more stringent requirements as described in relevant sections of the Graduate Bulletin. Each department/program determines how to evaluate the individual requirements in a holistic assessment of the applicant's potential for success in graduate study in a particular field. Additional factors, such as prior professional experience, may also be taken into consideration.

1. **Graduation from a regionally accredited college or university or its equivalent**. Departments may admit graduate applicants with three-year bachelor's degrees provided these three-year degrees allow the students to pursue graduate studies in their countries. Further, the department will require prerequisite/foundation courses as needed to fill in any gaps in the student's educational background.
2. **Required grade point average.** For admission to graduate study at VCU, the Graduate School requires a minimum undergraduate GPA of 3.0. For students with earned graduate degrees from accredited institutions, the graduate GPA may be the primary basis for consideration.
3. **Entrance examinations.** Submission of standardized graduate-level test scores (fewer than five years old) may be required by the individual program/department. Note: Not all programs require standardized test scores. Applicants are encouraged to visit individual department and program sections of the Graduate Bulletin for information about specific test score requirements.
4. **Letters of recommendation.** Three letters of recommendation from instructors or professional references in the applicant's intended field of study are required. Letters should address the applicant's academic and professional abilities and preparation for graduate study.
5. **Statement of intent.** Applicants must state their reasons for pursuing graduate education in their planned course of study at VCU.
6. **Such additional requirements as may be established by individual programs and schools**. These may include personal interviews, auditions, submission of a portfolio or other materials.

An exception to the general admissions requirements is made for students entering through the Guaranteed Admissions Programs of the VCU Honors College. (See the heading Guaranteed admission through The Honors College (p. 35) in this section.)

Revised 4/8/2014; 5/12/2015; 5/10/2016
University Graduate Council

Types of admissions

Students may be admitted to graduate study under one of the following classifications:

Degree-seeking student

An applicant who meets all requirements for admission to a degree program and who has been recommended by the department or school in which the applicant proposes to study may be admitted as a degree-seeking student.

In order to finalize admission, an official transcript showing degree(s) awarded and any other required documentation must be provided by the end of the fourth week of the first semester of matriculation in the program. Holds will be placed by the Graduate School on all future registrations for students who do not submit required documentation by this deadline.

Revised 4/8/2014
University Graduate Council

Nondegree-seeking student

An individual who wishes to take graduate courses without formal admission to a degree program is classified as a nondegree-seeking student. There is no limit to the total number of credits a nondegree-seeking student may take, as long as the student's academic performance is credible. In courses where enrollment is limited, first priority is given to students admitted to the program, followed by other VCU graduate degree-seeking students. Nondegree-seeking students are not exempt from any prerequisite that may be specified for a course. **A nondegree-seeking student who is later admitted as a degree-seeking student will not be allowed to apply toward a degree more than six credits earned as a nondegree-seeking student.**

In order to enroll in graduate courses as a nondegree-seeking student, students must have graduated (or be in final term expecting to graduate) from a regionally accredited college or university or its equivalent. Information and forms certifying eligibility (http://rar.vcu.edu/forms) to take graduate courses are available at VCU Records and Registration service centers or from the Office of Admissions.

Revised 4/8/2014
University Graduate Council

Guaranteed admission through The Honors College

Active members of The Honors College may apply to The Honors College Guaranteed Admission Program for certain graduate programs either before matriculation at VCU or early in their undergraduate studies. The specific deadline for applying is set by the program. Upon graduation, honors students in the Guaranteed Admission Program may enter the graduate program to which they have applied, provided they have satisfied all of the program requirements.

Interested students should meet with the senior associate dean of The Honors College prior to making application for guaranteed admission to a graduate program. Following that meeting, the student must submit a completed graduate application form with three letters of recommendation to Graduate Admissions. To be accepted into The Honors College Guaranteed Admission Program, a student must be accepted by the university, by the Office of Admissions and by the admissions committee of the program the student wishes to enter. The admissions committee may require an interview. Final notification of guaranteed admission is made by the Office of Admissions.

For additional information, refer to The Honors College (http://bulletin.vcu.edu/undergraduate/honors-college) section of the Undergraduate Bulletin, or contact The Honors College at Box 843010, Richmond, VA 23284-3010; (804) 828-1803; or honors.vcu.edu (http://www.honors.vcu.edu).

Revised 4/8/2014
University Graduate Council

Programs that offer guaranteed admission through The Honors College include:

- Doctor of Dental Surgery
- Doctor of Medicine
- Doctor of Occupational Therapy
- Doctor of Physical Therapy
- Doctor of Philosophy
  - Anatomy and Neurobiology
  - Biochemistry
  - Biomedical Engineering
  - Biostatistics
  - Human Genetics
  - Microbiology and Immunology
  - Neuroscience
  - Nursing
  - Pharmacology and Toxicology
  - Physiology
  - Psychology
  - Systems Modeling and Analysis
- Master of Accountancy
- Master of Arts
  - Economics
  - History
- Master of Bioinformatics
- Master of Business Administration
- Master of Education
  - Adult Learning
  - Counselor Education
  - Special Education
    - Early childhood
    - General education
    - Severe disabilities
- Master of Environmental Studies
- Master of Health Administration
- Master of Product Innovation
- Master of Public Administration
- Master of Public Health
- Master of Science
  - Anatomy
  - Biochemistry
  - Bioinformatics
  - Biomedical Engineering
  - Biostatistics
  - Business
  - Clinical Laboratory Sciences
  - Computer Science
  - Criminal Justice
  - Environmental Studies
  - Forensic Science
  - Genetic Counseling
  - Gerontology
  - Health and Movement Sciences
  - Human Genetics
  - Information Systems
  - Mathematical Sciences
  - Microbiology and Immunology
  - Nursing
  - Pharmacology and Toxicology
  - Physics/Applied Physics
  - Physiology
  - Rehabilitation Counseling
  - Sociology
- Master of Science in Nurse Anesthesia
- Master of Science in Occupational Therapy
- Master of Taxation
- Master of Teaching
- Master of Urban and Regional Planning

Multiple admissions

Students may not be admitted and enrolled in more than one graduate program or in an undergraduate and graduate degree program, except as part of an approved bachelor's-to-master's curriculum without petitioning and receiving written permission from the program director of each program in which the student is enrolled and the dean of the Graduate School.

Revised 4/8/2014
University Graduate Council

International students

The university encourages qualified international students to seek admission to VCU. U.S. government regulations and VCU admission policies require nonimmigrant applicants to demonstrate:

- Satisfactory academic achievement
- Adequate English language proficiency
- Ability to finance all educational and living expenses

International students are advised to refer to university and program admission requirements in this bulletin for other information requested of all applicants. An applicant must have earned a bachelor's degree from an accredited institution in the United States or an equivalent degree from a recognized foreign institution. Official academic records must be submitted.

English language proficiency requirement

To ensure maximum benefit from academic study at VCU, all non-native English-speaking applicants, regardless of immigration status, must provide evidence of English language proficiency before admission and/or enrollment in the university.

An applicant may satisfy university English proficiency requirements by obtaining a satisfactory score on the TOEFL. The university minimum TOEFL score requirement is 550 (paper-based) or 80 (Internet-based). Some graduate programs will accept satisfactory scores on the IELTS as evidence of English proficiency. The university minimum IELTS score requirement is 6.5. The PTE is also accepted with a minimum score of 65. Individual programs may require higher scores. TOEFL, IELTS and PTE scores are valid for two years.

The Office of Admissions reserves the right to require additional testing and study in the VCU English Language Program prior to full-time enrollment in university courses. The university offers a full-time English-as-a-Second-Language noncredit program. For information on the VCU English Language Program, including fees, international students can contact the English Language Program, Virginia Commonwealth University, Box 843043, Richmond, VA 23284-3043, United States; (804) 828-2551, or by email: oie-elp@vcu.edu; or online at global.vcu.edu/elp (http://www.global.vcu.edu/elp).

Nonimmigrants (students with temporary U.S. visas)

Because of the amount of time required to process applications from international students and for international students to obtain their visas, prospective students should apply well in advance of the international application deadlines. The deadlines are April 1 for fall semester, Oct. 1 for spring semester and Feb. 1 for summer session. Students also must meet specific program deadlines. All required admission documents must be submitted no later than eight weeks prior to registration if appropriate immigration documents are to be issued. Applicants who are unable to meet this credential deadline will need to defer the intended semester of entry.

Revised 4/08/2014
University Graduate Council

As VCU does not generally provide financial support for graduate international students, applicants needing a student visa (F-1) or a visiting scholar visa (J-1) also must present documented evidence of available financial support to cover annual living and educational expenses while studying at VCU.

Proof of current visa type must be submitted with the application for applicants who are in the United States on student visas. F-1 students and J-1 visiting scholars admitted to VCU must submit copies of all immigration documents to the VCU international student adviser prior to enrolling in classes.

Immigrants (permanent residents, resident aliens and asylum/refugee applicants)

Because immigrant applicants usually are in the United States at the time applications are submitted, these students are required to meet the same application deadlines as U.S. citizens.

If educated in the United States, immigrant students will be considered for admission under the same academic policies as those applied to U.S. citizens. If educated outside the United States, the same academic records are required as those for nonimmigrant students.

VCU requires detailed information concerning U.S. immigration status. Proof of permanent residency or application for permanent residency must be submitted with the admission application.

Admissions appeals

The Office of Admissions will hold denied applicants' transcripts and test scores for one year. To reapply within this period, applicants should first contact the department or program. Additional materials should be supplied to strengthen the application, such as new test scores, new letters of recommendation or a new statement of intent.

Application procedures

A link to the online application, other supplemental forms and instructions for applying to all graduate programs are available in the admissions and aid section of the VCU website (https://www.vcu.edu/admissions/apply/graduate).

A $65 nonrefundable application fee must accompany each application. This fee will not be credited toward tuition payment.

Completed applications and all supporting materials must be submitted according to the application guidelines provided in this bulletin and before the program deadlines specified throughout this website. Late applications for some programs may be considered when possible but may require provisional action.

Note: Reference letters, the statement of intent/personal essay and any other supplementary materials such as art portfolios, resume/vita or specific program-required documents should be submitted to the address specific to the program to which you are applying. However, some programs require that all application materials be sent directly to the Graduate School.

Application instructions, including how to submit supplementary materials, and a list of program-specific addresses for supplemental materials (https://www.vcu.edu/admissions/apply/graduate) is available on the Graduate Admissions website. All transcripts and test scores must be submitted to Graduate Admissions. Supporting documentation submitted by mail should be addressed to Virginia Commonwealth University, Office of Admissions, Box 843051, Richmond, VA 23284-3051. Application materials submitted in person may be delivered to the

Graduate Admissions office on the third floor of Blair House, 408 W. Franklin St., Richmond, Virginia.

Graduate students must use the Office of Admissions' online graduate application (https://www.vcu.edu/admissions/apply/graduate). Supporting materials for online applications must be submitted promptly. An application cannot be given final consideration until all required documentation and the application fee have been received. Applicants are strongly encouraged to pay by credit card when submitting the online application.

Students are encouraged to apply well before the program deadline to ensure receipt of all application materials. Program deadlines are found with degree/program information elsewhere in this bulletin. Use the program index to navigate to the program(s) of interest.

Completed applications and supporting materials are reviewed by the graduate faculty of the intended program, and final official notification of acceptance is made by the Office of Admissions.

Admission to a graduate program may be contingent upon the successful completion of undergraduate course work, degrees or other prerequisites that may be specified by the program or school. Remedial course work will not apply toward a graduate degree.

Students who do not apply at least one month prior to the beginning of any semester risk their financial aid eligibility in the event that the admission process is not completed prior to the first day of classes.

Apply (https://www.vcu.edu/admissions/apply/graduate)

Financing graduate school

Current information on financial aid programs, policies and procedures are available on the VCU website at finaid.vcu.edu (http://finaid.vcu.edu). To obtain printed materials or additional information, call or visit the appropriate financial aid office listed.

Monroe Park Campus programs
Grace E. Harris Hall
1015 Floyd Avenue, First Floor
Box 843026
Richmond, Virginia 23284-3026
Phone: (804) 828-6669
Fax: (804) 827-0060

Schools of Allied Health Professions, Nursing and Pharmacy
VMI Building, Room 334
1000 East Marshall Street
Box 980277
Richmond, Virginia 23298-0277
Phone: (804) 828-2702
Fax: (804) 827-0060

School of Dentistry
Lyons Building, Room 309
520 North 12th Street
Box 980566
Richmond, Virginia 23298-0566
Phone: (804) 828-9953
Fax: (804) 828-6072

School of Medicine
McGlothlin Medical Education Center
1201 East Marshall Street, Room 4-306
Box 980565
Richmond, Virginia 23298-0565
Phone: (804) 828-4006
Fax: (804) 827-5555

Policies and procedures on graduate fellowships and assistantships

University graduate teaching and research assistantships and fellowships are awarded to continuing and newly admitted graduate students. These awards are provided with funds from the university, government, foundations, industrial sources, alumni and other private sources. Most fellowships and assistantships are granted on a competitive basis to eligible applicants and determined based on scholarly potential and excellence. Awards range from assistance for tuition and fees and research expenses to stipend support for full-time study and research in programs leading to graduate degrees.

The decision to award most stipends is determined by the department or school to which the applicant is seeking admission. Applicants for fellowship and assistantship support are notified by the department or school soon after the decision has been made. Fellowship and assistantship awards for new and continuing students are granted on a competitive basis, normally for a period of one academic year.

Inquiry about such awards should be made directly to the school or department in which the student intends to enroll. Students in the process of applying for admission should indicate their interest in such support. Some programs include a separate application for support with the application for admission. Refer to the individual chapters in this Bulletin, program websites and the Graduate School website (http://graduate.vcu.edu) for additional information on graduate student support and funding opportunities.

VCU fully subscribes to the following resolution of the Council of Graduate Schools (http://cgsnet.org) in the U.S. and Canada regarding graduate scholars, fellows, trainees and assistants:

"Acceptance of an offer of financial support (such as graduate scholarship, fellowship, traineeship or assistantship) for the next academic year by a prospective or enrolled graduate student completes an agreement that both student and graduate school expect to honor. In that context, the conditions affecting such offers and their acceptance must be defined carefully and understood by all parties."

The council provides the following comments on the CGS resolution:

"Students are under no obligation to respond to offers of financial support prior to April 15; earlier deadlines for acceptance of such offers violate the intent of this Resolution. In those instances in which the student accepts an offer before April 15 and subsequently desires to withdraw that acceptance, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to this resolution that a copy of this resolution should accompany every scholarship, fellowship, traineeship and assistantship offer."

Graduate fellowships

Fellowships are not work-related and are designed to free students to spend all of their time on graduate studies and research. Fellowships are awarded on the basis of a student's demonstrated academic achievement, promise and need.

Fellows are required to maintain strong academic records and to remain in residence as full-time students during the fellowship period unless special approval is given by the dean of the Graduate School.

Requests for graduate fellowships from students seeking admission to the university should be included in the personal statement submitted with the application for admission and/or on supplemental forms required by individual departments or programs. To be considered for a fellowship, students must return application forms to the university in accordance with deadlines established by the individual departments or programs.

Fellowships for minority students, such as those provided by the National Science Foundation and Ford Foundation, are made by the sponsoring agencies to individual students. Applications are submitted directly by the students to the sponsor, usually in early fall.

A number of graduate tuition fellowships are funded by the commonwealth of Virginia. Funding for this program is allocated by the Graduate School to individual schools and program directors who, in turn, identify recipients. These fellowships are awarded in most graduate departments with preference given to Virginia residents. Tuition fellowships may range from a minimum of $500 a semester to full tuition and fees for an entire academic year.

Fellowships are awarded for not longer than one calendar year and are not renewed automatically from year to year unless specifically stated in writing. Graduate program directors generally determine eligibility for renewal of fellowship awards in subsequent years.

Graduate assistantships

Graduate assistants are typically more effective members of their chosen fields due to formal instruction and close interaction with faculty by assisting faculty in classrooms, research or administrative endeavors. All graduate assistant duties are designed to foster student training and graduate learning experiences.

Although assigned teaching, research or administrative support duties, graduate assistants are regarded by the university as students and not as employees. As such, graduate assistants do not accrue paid sick leave, annual leave or holiday leave.

A number of graduate assistantships are awarded each year on the basis of exceptional scholastic achievement, promise and competence for service in the departments of the university. Assistantships are generally also available in those departments which have government, foundation, business and industrial research grants and contracts.

The duties of graduate assistants require work from 10 to 20 hours per week, depending on the stipend awarded. Graduate assistants must satisfactorily perform the duties assigned by their departments; make satisfactory progress in their programs as defined by the degree requirements and the regulations of their departments; and may not hold any employment or appointment of a remunerative nature during the term of their assistantship.

Additional opportunities for involvement in outside activities may arise in the course of the training period, some of which may provide for additional/supplementary compensation. Involvement and/or participation in such opportunities may assist the department in maintaining the research infrastructure, provide additional experience in instructional activity, assist other units of the university in the delivery of programs consistent with the missions of the institution, involve participation in university organizations and so forth. Such activities may include those for which supplementary compensation is provided. While such activities have the potential for enriching the development of the individual graduate student, they also hold the potential for interfering with the graduate student's responsibilities to his/her department or program and her/his timely progress toward the completion of his/her educational degree requirements.

Therefore, graduate students **must** consult with their advisers prior to undertaking additional activities that may detract, or which have the potential for detracting, from their timely progress to degree completion. Advisers are encouraged to provide/encourage opportunities which broaden the training experience for students in preparation for the wide variety of career opportunities now available. The graduate program director should also be made aware of any such activities to ensure that completion of degree requirements is not compromised.

Some graduate assistants are appointed to support faculty when conducting research. Whenever possible, these assistants will be assigned to faculty who are working in a variety of areas to extend the student research experience and professional development. Graduate assistantships that involve research are generally assigned to those students pursuing degrees that require a thesis or a dissertation.

Other graduate assistants are assigned to departments, divisions, institutes, schools and other offices of the university to assist in the administration of these units. Such assignments are generally given to those pursuing professional degrees in the management sciences. These assistants will be exposed to a variety of administrative experiences and tasks as an integral part of their academic endeavors to prepare them for future professional roles as administrators.

Graduate assistantships are awarded for not longer than one calendar year and are not renewed automatically from year to year unless specifically stated in writing. Graduate program directors generally determine eligibility for renewal of graduate assistantship awards in subsequent academic years. Specific work assignments, scheduling and arrangements relating to vacation and personal leave are determined by the department, program or administrative unit to which the graduate student is assigned.

Required compliance with the commonwealth of Virginia Manpower Control Program

VCU is an agency of the executive branch of the commonwealth of Virginia. The commonwealth's Manpower Control Program stipulates that employees in the executive branch who are not eligible for benefits under a health care plan established by the Virginia Department of Human Resource Management or by an agency administering its own health care plan may not work more than 29 hours per week on average over a 12-month period. Eligibility for the health care plans is limited to classified state employees, salaried faculty as defined in the state health insurance manual and postdoctoral scholars paid through the university.

All other employees, including graduate assistants, may not work more than 29 hours per week on average over a 12-month period, regardless of

the number of positions they hold at VCU that are ineligible for the health care plans. Graduate students should not hold both an assistantship and an hourly or adjunct instructor position at the same time. In exceptional cases, schools/colleges may authorize graduate assistants to have additional jobs, but only if both jobs do not exceed 29 hours total in a work week in compliance with the Manpower Control Program. Noncompliance with the Manpower Control Program exposes VCU to the risk of significant penalties and costs and constitutes a violation of state requirements.

Eligibility

Students who are candidates for appointment as graduate fellows and assistants are responsible for meeting the following eligibility requirements and for taking the initiative in ascertaining that all have been fulfilled. The requirements are described here to provide graduate student applicants with an understanding of the usual conditions for awarding fellowships and assistantships; however, individual schools, departments or programs may set more rigorous standards.

An entering student is awarded an assistantship or fellowship on the basis of academic potential. The student is expected to have been admitted fully and without academic provision, having achieved a minimum grade point average of 3.0 on a 4.0 scale for the last 60 semester hours of academic credit earned. Another indicator of academic potential is a score on the Graduate Record Examination that places the applicant above the 50th percentile of all students who take this examination. In those disciplines requiring GRE subject tests, an upper 50th percentile achievement is required. An equally high achievement level is expected on the Graduate Management Admissions Test, the Law School Admissions Test or the Miller Analogies Test. Students applying for studio and performing arts must demonstrate potential through the quality and promise of their portfolio or audition.

Graduate fellows and assistants, once appointed, must maintain a minimum grade point average of 3.0. Graduate students may be retained as fellows and assistants only as long as they are registered as current, full-time students in good academic standing and are satisfactorily performing their teaching, research or administrative duties.

Appointment and notification

Each year the dean of the Graduate School will notify individual department chairs, program directors and deans of the allocation of the university's graduate student support funds. This notification will include detailed award criteria and instructions for processing these funds. It is the responsibility of each awarding unit to provide funded graduate students with award letters which clearly define the amount, term of appointment and conditions of the award, including the job description of assistantships, renewal criteria, associated tuition and fee support, disbursement information, and minimum enrollment requirements. Award letters should also be provided to students funded by other sources, such as department funds, grants and overhead accounts.

Notices of awards should include the Graduate School policy statement on graduate fellowships and assistantships and the university's student tax guide [PDF] (http://www.hr.vcu.edu/media/hr/documents/studenttaxguide.pdf). Graduate students should be instructed to return signed copies of award letters to the awarding unit(s) in order to acknowledge that they have read these documents and to indicate acceptance of the award and its conditions. All newly appointed graduate assistants will be subject to a criminal records check as a condition of employment at VCU.

Termination of appointments

Graduate assistantships and fellowships normally end when the period of appointment is concluded and the term of the assistantship or fellowship agreement is fulfilled. An appointment may also end when the grant or contract supporting the student expires, even if that occurs before the end of the student's current appointment. Otherwise, a graduate fellowship or assistantship may be terminated for the following reasons:

1. Resignation for cause by the student. Such resignation is to be in writing for approval by the department chair or program director, with a copy to the dean of the Graduate School.
2. Failure of the graduate fellow or assistant to perform assigned duties adequately or to behave professionally. Termination of assistantship or fellowship appointments requires written documentation to support the action. Documentation should clearly show that the infraction, any needed remedy and consequences were conveyed to the graduate student in writing in a timely manner. Such termination is to be recommended by the department chair or program director, with a copy to the dean of the Graduate School.
3. Failure of the graduate fellow or assistant to remain in good academic standing or to adhere to enrollment policies in accordance with this policy statement.

Any stipend funds remaining after termination of a graduate fellowship or assistantship revert to the funding department or program and may be reallocated to another graduate student. If students withdraw from classes or programs or reduce enrollment below full time, tuition and fees and stipends may be rescinded and students will be responsible for returning all funds to the university. Exceptions are made on a case-by-case basis by the dean of the Graduate School on the recommendation of the student's graduate program director.

A graduate student who believes that his or her graduate fellowship or assistantship has been terminated unjustly, and who has exhausted all departmental and school appeal procedures, may appeal the decision in writing to the dean of the Graduate School. A student who wishes to appeal a termination of a graduate fellowship or assistantship must notify the graduate dean in writing within 10 business days after the decision to terminate has been upheld by departmental and school appeal procedures.

Minimum course load

During the academic year, all graduate fellows or assistants whose tuition is being paid by the university must enroll for at least nine hours of graduate course work each semester. Undergraduate credits may be included in the minimum, provided they are relevant to the student's degree program and approved by an adviser and the dean of the Graduate School. Courses taken for audit are not counted toward the enrollment requirement. Students awarded summer stipends and tuition are expected to enroll for at least three credit hours during the summer session [change approved by the Graduate Council April 14, 2009, effective summer 2009]. All students are subject to the continuous enrollment rules (p. 29) published in the VCU Graduate Bulletin.

Stipends

Stipends for graduate assistantships vary by discipline, level of degree, hours of work required and availability of funds. All graduate assistantships, however, are subject to the university's minimum stipend levels. For nine- and 10-month assistantships, minimum stipends are $4,000 for 10 hours of work per week and $7,500 for 20 hours of work per week. For 12-month assistantships, minimum stipend levels are

$5,000 for 10 hours of work per week and $9,000 for 20 hours of work per week. Not all appointments guarantee payment of tuition and fees, nor do payment schedules necessarily coincide with registration dates.

Tuition and fee support

Tuition and fee support associated with graduate fellowships and graduate assistantships varies from year to year and by program. Awards typically include the stipend plus university tuition. Payment of special program or class fees varies from program to program. Students are responsible for settling their accounts according to the rules and procedures of the university's Student Accounting Department (http://www.enrollment.vcu.edu/accounting).

Tuition will be charged according to a student's official residency status as determined by the university's residency office (http://www.enrollment.vcu.edu/rar/residency). Questions related to residency status should be directed to that office.

Per the 2017 Virginia Acts of Assembly, "Nonresident graduate students employed by an institution as teaching assistants, research assistants, or graduate assistants and paid at an annual contract rate of $4,000 or more may be considered resident students for the purposes of charging tuition and fees."

Payments and tax status

The stipend portion of a graduate assistantship package is designated by the Internal Revenue Service as wages for work performed, is processed through the university's Payroll Office and is subject to withholding taxes. A graduate assistantship stipend is reported to the IRS as earned income. Tuition and fee support, if provided, is processed through the university's Office of Financial Aid and is applied directly to the student's account.

A graduate fellowship stipend is not work-related and is not reported to the IRS as earned income. A recipient of a graduate fellowship, however, may be required to report fellowship support as other income and to pay quarterly withholding taxes. Graduate fellowship stipends and tuition and fee support are processed through the university's Office of Financial Aid (http://www.enrollment.vcu.edu/finaid) and are applied directly to the student's account. Once all outstanding tuition, fees and other charges are paid, excess funds are refunded to the student.

For additional information about the tax status of student awards, students are referred to the student tax guide [PDF] (http://www.hr.vcu.edu/media/hr/documents/studenttaxguide.pdf) published by the Office of the Vice Provost for Student Affairs and the Office of Payroll Accounting. In all cases, final decisions and interpretations as to the tax status of graduate assistantship or fellowship stipends or tuition and fee awards are made solely by the IRS and, ultimately, it is the student's responsibility to ensure accurate reporting of such support.

Need-based financial aid

All graduate fellowship and tuition and fee awards are reported to the university's Office of Financial Aid and are included in any calculation of financial aid need. Fellowship funding impacts need-based financial aid eligibility differently than funding received from graduate teaching and research assistantships. Students with questions about their need-based financial aid packaging should contact their financial aid advisers, graduate program directors or departmental fiscal administrators about the status of their funding before accepting offers.

Revised 7/17/2014; 6/16/2015

University Graduate Council

eServices – online records access

Students are encouraged to use eServices, a password-protected service for viewing VCU student records online, to check the status of their financial aid application and award package. Students also may register for classes, print bills and more. The eServices website is located at eservices.vcu.edu (http://www.eservices.vcu.edu).

Email – official method of communication

Students are required to obtain an official VCU student email account within one week of the beginning of their first semester of enrollment. Students are responsible for reading in a timely fashion university-related communications sent to their official VCU student email account. The Office of Financial Aid uses email to provide financial aid information, to request documentation to support financial aid application data and to provide financial aid application status and award information. Information on how to set up an account is available online (http://www.ts.vcu.edu/askit/email).

Identification requirements

Students must provide picture identification, preferably a VCUCard, for in-person access to financial aid records. For the student's protection, information provided over the telephone and email may be limited if the financial aid staff member is not confident of the student's identity.

Eligibility for financial aid

Most students are eligible for some type of financial aid regardless of family financial circumstances. Basically, to receive aid from any of the federal or state student aid programs, students must:

- Submit a Free Application for Federal Student Aid or Renewal FAFSA designating VCU (school code 003735) to receive FAFSA results
- Demonstrate financial need, except for some loan programs
- Have a high school diploma or a General Education Development certificate
- Be enrolled or accepted for enrollment to an eligible degree or certificate program
- Be enrolled at least half time (five or more graduate credit hours)
- Be a U.S. citizen or eligible noncitizen
- Have a valid Social Security number (unless from the Republic of the Marshall Islands, the Federated States of Micronesia or the Republic of Palau)
- Meet Satisfactory Academic Progress standards as defined by the VCU Office of Financial Aid (The full VCU SAP policy is available on the Web at finaid.vcu.edu/progress/gradrequirements.html (http://finaid.vcu.edu/progress/gradrequirements.html).)
- Certify that federal and state financial aid will be used for educational purposes only
- Not be in default on a federal student loan and not owe money on a federal student grant
- Comply with Selective Service registration, if required
- Not be convicted under federal or state law of sale or possession of illegal drugs

Students admitted as provisional graduate students are eligible for federal loans at the fifth-year undergraduate level.

Detailed information can be found in the federal Student Guide, available in print form from the VCU Office of Financial Aid or electronically at studentaid.ed.gov/students/publications/student_guide (http://studentaid.ed.gov/students/publications/student_guide) and on the VCU Office of Financial Aid website. (http://finaid.vcu.edu)

Applying for financial aid

The financial aid application process for the academic year begins Oct. 1. All students are encouraged to complete and submit the FAFSA as soon as possible after Oct. 1, designating VCU (school code 003735) to receive the results. In order to reduce problems, errors and omissions on the FAFSA, students are encouraged to apply electronically using FAFSA on the Web (available online at fafsa.ed.gov (http://www.fafsa.ed.gov)). Once the FAFSA is filed, the federal processor will send the student a Student Aid Report or electronic SAR acknowledgement and also will electronically send the information to the VCU Office of Financial Aid, if VCU was listed as a school to receive the data. If additional information is needed to complete processing of the application, the VCU Office of Financial Aid will send the student a request for additional information. Responding promptly to such requests will ensure timely processing of the application. Once the review of FAFSA data has been completed, the Office of Financial Aid will send the student a financial aid award notification.

Please note that health professions students (dentistry, medicine, nursing or pharmacy) must provide both student and parental information on the FAFSA to apply and receive consideration for Title VII grants and loans from the Department of Health and Human Services.

Priority filing dates

The VCU Office of Financial Aid recommends electronically filing the FAFSA by March 1.[1] Students should complete the FAFSA using data from their completed tax returns. If necessary, they may use estimated tax return data in order to meet the VCU priority filing date but should be prepared to submit a copy of their completed tax returns and W2 forms to VCU as soon as possible. Students will receive their financial aid award notification after their FAFSA application data has been verified. If students have not applied for financial aid in a timely manner, they may want to participate in the VCU installment payment plan, which budgets each semester's bill over four payments. Information about this plan can be found on the Student Accounting Department's website (accounting.vcu.edu/installment (http://accounting.vcu.edu/installment)).

[1]Students who do not have access to the Web may apply using the paper FAFSA, available through VCU, high schools, colleges and most public libraries. Those students completing a paper application should mail it to the federal processor by Feb. 1.

Summer studies

Limited financial aid may be available during the summer semester. Students applying for the summer semester must file the FAFSA by March 1. Students also should complete a VCU summer aid application, available on the Financial Aid website under "Forms (http://finaid.vcu.edu/resources/forms.html)"

Students interested in financial aid for the summer semester should obtain a VCU Summer Studies Schedule of Classes (http://www.vcu.edu/schedule) (available in March) for more details.

Study abroad

Financial assistance is available to eligible students enrolled in approved study abroad programs. All study abroad programs must be coordinated through the Global Education Office at (804) 827-7882. Students should work with a financial aid counselor to coordinate aid for their study abroad program. Information about financial aid and study abroad is available online at global.vcu.edu/abroad/students/funding (http://global.vcu.edu/abroad/students/funding).

All study abroad course work is subject to the criteria articulated in the transfer credit policy.

Quality assurance

To ensure that information provided on the FAFSA is accurate, a student's application may be selected for review at any time during an enrollment period, and the student will be requested to provide documentation that supports the information. By signing the FAFSA, the student (and the student's parents or spouse, if applicable) agreed to furnish such documentation. If the documentation is not provided when requested, financial aid awards will be canceled and any funds already disbursed may need to be repaid.

University bill

The Student Accounting Department issues online bills for tuition, fees and other university charges. When financial aid awards (grants, scholarships and loans) are not enough to pay university charges, the remaining balance must be paid from personal funds, credit card or the VCU installment payment plan. Federal work-study awards will not be deducted from university charges because those funds are paid directly to the student, based on hours worked. Any outstanding balance owed will prevent a student from registering for courses and receiving official transcripts. Students who fail to pay their balance on time may be assessed a late payment fee and have a financial hold placed on their account. If the balance remains outstanding after the semester ends, their account may be referred to the VCU collection unit at which time collection costs will be assessed.

Types of financial aid

There are three basic types of financial aid: loans, grants and work-study. Each type has different features and advantages.

Loans

In terms of total dollars available, long-term federal loan programs provide the most dollars. Federal loans must be repaid after the grace period and/or deferment periods have expired. Students must generally remain enrolled at least half time (five credit hours for graduate students). Multiple repayment plans may be available for most federal loans. Selected loan programs include:

- Federal Direct Loan (unsubsidized)
- Health Professions Student Loan
- Loan for Disadvantaged Students
- Nursing Student Loan

To ensure that students understand the responsibility and the obligation they are assuming as a Federal Direct Loan borrower, the U.S. Department of Education requires participation in entrance counseling prior to receiving a Federal Direct Loan if the student has not previously received a Direct Loan, Federal Family Education Loan or Supplemental Loans to Students Loan. The entrance counseling requirement must be satisfied prior to the first loan disbursement. A student will also be required to complete exit counseling before they graduate, withdraw or drop below half-time status. Visit the StudentLoans.gov website (https://studentloans.gov) to complete entrance and exit counseling.

Grants

Contact individual academic departments for information about grant or scholarship programs.

Work-study

Work-study is a form of financial aid that pays wages for work performed through employment. Work-study positions are located on campus and in approved off-campus locations. Hourly wages will vary depending on skills and experience. Job listings are posted on the Financial Aid website (https://finaid.vcu.edu/types/workstudy). When interviewing for work-study positions, students should take copies of their financial aid award notifications to show prospective employers. Graduate students usually work 15 to 25 hours per week.

Financial aid appeals

Financial aid eligibility decisions are made using federal, state and institutional regulations and policies. Students may appeal their eligibility if special circumstances warrant a review. Reasons for an appeal might include one of the following documented unusual circumstances:

- Loss or reduction of employment earnings
- Disability or death of parent or spouse
- Separation or divorce
- Loss or reduction of untaxed income
- Losses due to a natural disaster
- Unusually high educational program costs
- Unusual medical expenses
- Dependent and child care expenses

Any financial aid staff member can advise a student about the procedures on how to file an appeal.

Federal and state financial aid refund policy

Students who receive federal Title IV or state grant or loan assistance and withdraw from VCU before completing 60 percent of the semester (as measured in calendar days) must have their eligibility recalculated based on the federal return of Title IV funds formula. This federal formula specifies that a student's financial aid eligibility must be recalculated based on the aid the student has "earned" (based on the number of days that the student was enrolled or attending VCU prior to withdrawal). Any unearned aid (for the period of enrollment that the student did not complete from the date of withdrawal to the end of the semester) must be returned to the appropriate Title IV or state programs from which the student was awarded.

For VCU students who withdraw prior to completing 60 percent of the semester, they will have to return or repay all or a portion of the aid funds that had been disbursed to their VCU account. As a result, students who withdraw prior to completing 60 percent of the semester may be responsible for all or a portion of their tuition/fee bill that was previously paid by financial aid sources.

If a student does not officially withdraw from all classes but fails to earn a passing grade in at least one course, federal aid regulations require that the student be considered "unofficially withdrawn," unless it can be documented that the student completed the enrollment period. Unofficial withdrawals require a Title IV refund calculation at the midpoint of the enrollment period. The reduction of federal and state aid will create a balance due to the university that must be repaid.

Satisfactory academic progress for financial aid purposes

To be eligible to receive financial aid at VCU, students must make satisfactory academic progress. SAP is a combination of qualitative and quantitative components. SAP is measured by:

- **GPA.** Graduate students must maintain a 3.0 cumulative GPA.
- **Completion rate.** The completion rate is measured by the number of credit hours earned divided by the number of credit hours attempted. All students must successfully complete at least 67 percent of all credit hours attempted (withdrawals, incompletes and repeated courses also are considered attempted credit hours).
- **Overall progress toward degree/certificate.** Overall progress is measured by the number of credit hours attempted divided by the number of credit hours necessary to complete the degree or certificate program. Students who need financial aid funding may attempt no more than 150 percent of the hours required to complete their degree or certificate program.

The Office of Financial Aid will perform a periodic SAP review for students who receive or apply for financial aid. The reviews are typically performed at the end of the spring semester and must be completed at least once per academic year. Students will be alerted with warning letters, whenever possible, to provide them with notice that their financial aid may be in danger of being suspended. When students fail to meet SAP requirements, they will receive suspension letters indicating that they are ineligible to receive further financial aid. Students whose eligibility for financial aid has been suspended may submit an appeal if mitigating circumstances prevented the student from maintaining SAP.

For more detailed information about the VCU satisfactory academic progress (http://www.finaid.vcu.edu/manage/sap) policy, visit the Office of Financial Aid website.

Graduate students in undergraduate courses

Students who are classified as graduate students will be eligible for federal financial aid only if they are enrolled at least half time in courses that can be applied toward their graduate degree. The Office of Financial Aid will identify all graduate students who have applied for financial aid but have registered for less than half-time graduate course work in any given semester. If the undergraduate course work for which the student has registered is considered preparatory to the graduate degree, documentation must be provided by the student's adviser or program

representative to verify which undergraduate courses are required. In these cases, the student will be eligible for federal financial aid, but it will be based on the fifth-year undergraduate loan limits. Students who have been admitted to a dual-degree program can take any amount of required undergraduate course work and will still be eligible for graduate loan limits.

Veteran and reservist educational benefits

Veteran's certification for VCU is completed within the Military Student Services office located in Grace E. Harris Hall on the Monroe Park Campus. Detailed information about eligibility for Veterans Affairs programs is available on the Military Student Services website (https://militaryservices.vcu.edu/benefits).

Military Student Services
Grace E. Harris Hall, Room 3122
1015 Floyd Avenue
Box 842536
Richmond, Virginia 23284-2536
Phone: (804) 828-6563
Fax: (804) 828-8212
Email: militaryserv@vcu.edu
militaryservices.vcu.edu (https://militaryservices.vcu.edu)

Available programs

For details on any of these programs, please visit the Military Student Services website benefits overview (http://www.militaryservices.vcu.edu/veterans).

- Montgomery – GI Bill Active Duty (Chapter 30)
- Vocational Rehabilitation (Voc Rehab, Chapter 31)
- Veterans Education Assistance Program (VEAP, Chapter 32)
- Post 9-11 GI Bill (Chapter 33)
- Survivors' and Dependents Educational Assistance Program (DEA, Chapter 35)
- Montgomery – GI Bill Selected Reserves (Chapter 1606)
- Tutorial Assistance Program
- VA Work-Study Program
- Virginia Military Survivors and Dependants Education Program
- Post 9-11 – Active Duty (Chapter 33)/Yellow Ribbon Program
- Yellow Ribbon Program
- Transferability of Benefit

Eligibility requirements

Eligible veterans/spouses/dependents must comply with the following requirements to receive educational benefits as students:

1. The veteran/spouse/dependent must be accepted into a degree or certificate program or be matriculating as a nondegree-seeking student for only two semesters before having to declare a major.
2. The veteran/spouse/dependent must request certification by completing and submitting VCU's VA education assistance form after obtaining approval via signature of their academic adviser and registering for courses each semester and each summer session from the Veterans Affairs Office.
3. The veteran/spouse/dependent is eligible to use benefits for only those courses taken toward a degree, certificate program or as prerequisite courses (only two semesters).
4. The veteran/spouse/dependent is not eligible to use benefits for courses taken on an audit basis, or if eliminating a course previously taken and paid for by the VA to remove a punitive grade not counted in GPA calculations via VCU's historical repeat option. The repeated course(s) will be paid for by the VA but the student will incur a debt to the VA for the course(s) eliminated from the student's GPA. The VA does not pay for courses that earn no credit.
5. The veteran/spouse/dependent is responsible for ensuring that transcripts are evaluated for transfer credits to be accepted by VCU. Students must submit this information to the Veterans Affairs Office for transmittal to the Veteran's Administration Regional Office.
6. The Veterans Affairs Office must be notified by the student/veteran/spouse/dependent if they change, add, drop or withdraw from courses originally approved by the student/ veteran/spouse/dependent's academic adviser and certified by VCU's Veterans Affairs coordinator/certifying official.

Graduate tuition and student fees

Students must pay all applicable tuition, housing and dining charges, and other fees when due, as described in this section. Students who fail to pay these charges on time may be assessed a late payment fee. The university reserves the right to revise or alter all tuition and fees, regulations pertaining to student fees, and collection procedures at any time. In addition to expenses billed by the university, students should make allowances for books, clothing, supplies, travel and other out-of-pocket costs when figuring their total yearly expenses at the university.

Student financial responsibilities

Students who enroll are responsible for:

- Full payment of tuition and fees generated from their registration.
- Full payment of all charges for housing and dining services, and other applicable miscellaneous charges.
- Keeping a current mailing address on file with Enrollment Services. Refunds and tax forms are not issued to students with inactive mailing addresses.
- Establishing an official VCU email address and reading their email on a regular basis, since email will be used to notify students when their invoices are available in the payment and billing site. Paper bills are not sent to enrolled students. Failure to acknowledge and review the electronic invoice does not relieve responsibility for timely payments. Other important notifications are also sent to the official VCU email address.

Tuition and fees are categorized and described on the Student Accounting website at enrollment.vcu.edu/accounting/tuition_fees.html (http://www.enrollment.vcu.edu/accounting/tuition_fees.html).

Full-time and part-time graduate study

Graduate students registered for nine to 15 credit hours are considered full-time and are charged a flat rate for tuition and fees. Graduate students registered for more than 15 credit hours during any semester will be charged an overload graduate tuition fee on a per-credit-hour basis above the full-time tuition rate. Graduate students registered for fewer than nine credit hours are charged a graduate per-credit-hour rate based on their program. Graduate students fully funded as graduate assistants or graduate fellows with tuition remission must register for at least nine credit hours per semester (three credit hours during the summer if funded on a 12-month stipend). Departmental requirements

may vary; therefore, students should verify expected course loads with their graduate program directors.

Nondegree-seeking students who hold bachelor's degrees are classified as DHG (degree-holder graduate) if they enroll in one or more graduate courses. DHG students are charged the graduate rate regardless of whether they enroll in graduate- or undergraduate-level courses. If they enroll for nine or more credits, they are charged at the full-time graduate rate.

Tuition and fee schedule

Tuition and fees are categorized and described on the Student Accounting website at accounting.vcu.edu/tuition (http://accounting.vcu.edu/tuition). Questions regarding tuition and fees may be directed to the Student Accounting Department at (804) 828-2228, or by emailing stuacctg@vcu.edu. The university reserves the right to revise or alter all fees, regulations pertaining to student fees and fee collection procedures at any time.

University fee

This fee is used by the university to support student facilities, campus development, intercollegiate athletics and other programs. Full-time students pay a flat-rate university fee each semester. Part-time students pay this fee on a per-credit basis.

Student activity fee

This fee is used to support social, cultural and other student activities on the Monroe Park Campus. These activities include concerts, plays, student organizations and publications. Full-time students on the Monroe Park Campus pay a flat-rate student activity fee, while part-time students on the same campus pay this fee on a per-credit basis. Students on the MCV Campus are not charged this fee.

Student Government Association fee

This fee is used to support social, cultural and other student activities on the MCV Campus. The fee is charged to all full-time and part-time MCV Campus students. Monroe Park Campus students are not charged this fee.

Student health fee

All full-time students on both campuses must pay the student health fee. Part-time students may participate in the University Student Health Services on an elective basis by paying the student health fee. USHS offers unlimited office visits for acute and chronic ailments, after-hours phone advice for an urgent medical problem and most laboratory tests associated with acute illnesses ordered by the USHS staff, among other services. The fee does not cover accidental injury, emergency room visits or hospitalization. More specific information as to what is covered and not covered by the fee is available on the USHS website (http://www.students.vcu.edu/health/about/eligibility-and-charges).

Technology fee

The technology fee is charged to all undergraduate, graduate and professional students in all programs. Full-time students pay a flat rate. Part-time students pay a per-credit-hour rate. The fee is used to provide for students' technological needs and to support university-wide technological initiatives.

Off-campus fees

The university fee, the student activity fee, the student government association fee (except School of Social Work) and the student health fee are not charged to students taking off-campus classes.

Capital outlay fee

This fee is charged to all full-time and part-time non-resident, on-campus students. The fee is mandated by the General Assembly to reimburse the State for debt service costs attributable to non-resident students related to the financing of buildings and equipment.

Online course fee

The online course fee is charged for undergraduate and graduate online courses. The fee covers operational and personnel support to develop and maintain online courses.

Special fee charges

Because of specialized programs, various schools and departments may charge each student additional fees to cover special materials, equipment breakage and other costs. For specific information about special fees, refer to the Student Accounting Department website or to the specific school or department section in this bulletin.

Student billing

Students must pay all applicable tuition, fees, room and board when due. Students are notified at their official VCU email address when their bills are available on the billing and payment site. No paper bills are sent to enrolled students. Tuition and fees for preregistered students, along with charges for housing and dining plans where applicable, are due by the official start of each semester. After the registration period all other students are sent a notification at their official VCU email address when their electronic bill has been issued and should pay by the payment due date indicated on the electronic invoice. Students who fail to pay these charges on time may be assessed a late payment fee. The university reserves the right to revise or alter all tuition and fees, regulations pertaining to student fees, and fee collection procedures at any time. In addition to expenses billed by the university, students should make allowances for books, clothing, supplies, travel and other out-of-pocket costs when figuring their total yearly expenses at the university.

The installment payment plan assists students in meeting the cost of their higher education by offering a convenient payment option. The university-administered IPP is offered only during the fall and spring semesters. The plan distributes the cost of tuition, fees, housing and dining charges for a semester into four equal installments.

All students attending the university with current charges of $100 or more are eligible to participate. All prior semester balances must be paid in full to be eligible.

Students who receive financial aid are also eligible for participation in the IPP. These students may deduct their aid to determine the net total due. If it is $100 or more, the remaining amount may be paid in installments.

In some cases, a student may receive a financial aid refund, and then subsequent charges for the semester are added to the student's account. If the student has received a refund, he or she is ineligible to participate in the IPP unless the refund has been repaid to the university in full. The

student must then pay the first installment and follow the instructions to enroll in the IPP.

There is a $25 nonrefundable application fee payable with the first installment of each semester. Interest is not assessed on the outstanding balance; however, installments not paid by the payment due date are subject to a late payment penalty. Information about how to participate in the IPP is available online at accounting.vcu.edu/installment (http://accounting.vcu.edu/installment).

Drop vs. withdraw

Drop charges are removed to indicate that the student never attended the class. The student is not eligible to receive financial aid, and any financial aid already credited to the student's account based on the original course registration will be removed from the student's account, which may create a balance due to the university.

Withdraw results in the academic grade of W. Charges are assessed and adjusted according to the University Refund Policy. Students may owe a balance to the university.

Refund of tuition and fees

The official university tuition and fees refund policy is applicable only for the fall and spring semesters. This table pertains to both complete withdrawals and reduced course loads for standard classes (excluding short/nonstandard courses). The policy is based on the weeks of the semester and not the class meeting days (if the semester begins on a Thursday, the first week of classes is from Thursday through the following Wednesday).

Refunds (reduction of charges) are calculated on a course-by-course, per-credit-hour basis, disregarding the full-time cap amounts and discounted tuition. Charges are recalculated based on the number of credit hours in which the student remains enrolled in addition to the nonrefundable percentage portion of credit hours for the withdrawn course(s). Students who are enrolled and withdraw from courses may not receive a reduction in charges.

- Students dropping/withdrawing from courses through the first week of class will be entitled to a 100 percent refund of tuition and fees.
- Students withdrawing from courses through the second week of class may be entitled to an 80 percent refund of tuition and the university fee.
- Students withdrawing from courses through the third week of class may be entitled to a 60 percent refund of tuition and the university fee.
- Students withdrawing from courses through the fourth week of class may be entitled to a 40 percent refund of tuition and the university fee.
- Students withdrawing from courses after the fourth week of class are not entitled to receive a refund of tuition and fees.

The refund policy and deadlines of the English Language Program are different from the university's refund policy for academic courses. Details of the policy may be obtained from the English Language Program office.

A full refund for holiday intersession will be granted if the course is dropped before 4:30 p.m. on the day of the first class meeting. Partial refunds are not granted.

A full refund for a short/nonstandard course's tuition and applicable fees will be granted if the course is dropped no later than the day following the first day of a given class. No refund of tuition and fees is given for withdrawals of short and nonstandard courses. Students should contact their program administrator for withdrawals from nonstandard classes that are longer than standard classes.

A full refund for summer tuition and applicable fees will be granted if the course is dropped no later than the day following the first day of a given class. (This policy also is applicable if the class does not meet on two consecutive days.) Students reducing their academic course loads to less than full-time (12 credits for undergraduates and nine credits for graduates) before the end of the last day to drop a course will be entitled to a refund of tuition and applicable fees reflecting the reduced course load. Partial refunds are not granted for the summer session.

Students who are financial aid recipients and withdraw from all courses prior to completing 60 percent of the semester are subject to the Federal Return of Title IV Funds Policy. For more details see Federal financial aid refund policy (p. 42).

Refunds will be computed based on the actual withdrawal date certified by the Office of Records and Registration. Refunds will not be made to students who do not attend classes and have not completed the required withdrawal procedure. Refund processing may take approximately two to three weeks. Exceptions to this refund policy are made only in rare instances. Written application for an exception must be filed in the Student Accounting Department to the refund appeals committee within three years.

Refer to the Residential Housing contract and Dining Services' terms and conditions for housing and dining services refunds.

Requests for refunds that are not generated from the overpayment of financial aid should be made in writing to: VCU Student Accounting Department, Box 843036, Richmond, VA 23284-3036. Refund request forms are available at the Student Services Center, 1015 Floyd Ave. or 1000 E. Marshall St., Room 323, and on the Web at accounting.vcu.edu/refunds (http://accounting.vcu.edu/refunds).

In accordance with credit card regulations, the university will refund any credit balance that may result on a student's account as the outcome of a credit card payment back to the credit card account. The remaining credit balance, if any, will be refunded to the student.

Students are responsible for paying any increase in charges that may occur after the generation of any refund.

Outstanding charges

Students who fail to meet payments when due will be assessed late payment penalties and will be denied registration for future classes until they have paid all accrued amounts owed. Students with balances owed to the university will not be issued degrees, official transcripts of grades or graduate reports until all charges are paid in full.

Any communication disputing an amount owed, including an instrument tendered as full satisfaction of a debt, must be submitted to the Director of Student Accounting, Student Accounting Department, Virginia Commonwealth University, Box 843036, Richmond, VA 23284-3036.

Pursuant to Section 2.2-4805 et seq., of the Code of Virginia, and in accordance with rules and regulations promulgated by the state comptroller and attorney general of the commonwealth of Virginia, VCU will charge interest, costs and fees on all accounts past due.

VCU is participating in the Virginia Set-off Debt Collection Act of 1981. Under the provisions of this act, a Virginia individual income tax refund will be subject to the university's claim for unpaid balances of tuition and fees.

A student who pays a past due balance with a dishonored payment item may be subject to having his or her current and/or future registration cancelled. A charge of $50 is levied for all dishonored payment items.

Military services tuition relief, refund and reinstatement guidelines

These guidelines apply to students whose service in the uniformed services (military) has necessitated their sudden withdrawal or prolonged absence from their enrollment at Virginia Commonwealth University and provides for the required re-enrollment of such students. Students are offered the following enrollment secession options:

1. Drop all courses before the end of the add/drop period and receive a full reduction of tuition and fee charges. Students residing in university housing and participating in a dining plan will be released from their housing and dining service contracts and will receive a prorated refund of these charges. Students will be asked to sign the drop request form with the director of military student services indicating that they are not receiving a financial aid refund. If the reduction of charges results in an overpayment on the account after any financial aid or third party awards have been reduced, the student will be issued a refund.

   This option might best meet the needs of students who are called to active duty service during the first week of school and did not receive a financial aid refund check or direct deposit.
2. Receive a grade of Incomplete (IM – incomplete military) in one or all courses. Students residing in university housing will be released from their housing and dining service contracts and will receive a prorated refund of these charges. Students who chose to take a grade of IM will not have tuition and fees reduced for these courses because, upon receipt of an approved change of grade, credits will still be earned for the semester. Students will have 12 months from the date that they return from active service to complete the course work and earn a course grade. If a student received financial aid, the amount recovered to the financial aid accounts will follow the Federal Financial Aid Refund Policy.

   This option might best meet the needs of students who have essentially completed all course work in a class for the semester, but have yet to turn in a final project, an exam or other materials. It should be agreed upon between the instructor and the student that the remaining course work can reasonably be completed during the 12-month period.
3. Accept administrative withdrawal (WM – withdrawn military) from all courses as of the effective date of the orders to active duty. If this option is elected, a full refund of all tuition, fees and prorated room and dining charges will be made. If a student received financial aid, the amount recovered to the financial aid accounts will follow the Federal Financial Aid Refund Policy. If the reductions of charges results in an overpayment on the account after any financial aid or third party awards have been reduced, the student will be issued a refund.

   This option might best meet the needs of students who are called to national service in the middle of a semester and have not completed 75 percent of their class requirements. This option also might best meet the needs of students who are leaving the university during the first week of class and received a financial aid refund check or direct deposit as a result of their financial aid.
4. Students who have completed 75 percent of the course requirements at the time of military activation and, notwithstanding certain exceptions noted below, who meet requirements as determined and agreed upon by the faculty instructor and the student may receive full course credit.

   Students may receive full course credit if 75 percent of course requirements have been completed, under certain circumstances. The instructor is responsible for determining what percentage of course requirements have been completed based on factors to include but not limited to contact time, examinations, projects, work experience and clinical experience. The awarding of full credit cannot be made where the incomplete requirements are essential components of the course or program required by law or regulatory bodies, required for competency in the work place, or required to complete licensure examinations.

Leaving the university

To initiate this process, the student must provide the Office of Military Student Services with a copy of his or her active duty orders in addition to a printed copy of his or her course registration for that semester and indicate Option 1, 2, 3 or 4 for each course. If Option 4 is selected, the student must provide documentation from the instructor. The director of military student services will forward all documentation to the university registrar to take the appropriate enrollment action, post the appropriate grades and send a copy of the orders and a copy of the student course request statement to the director of financial aid and the director of student accounting.

Returning to the university

Students who withdrew from the university as a result of military deployment, mobilizations or duty changes are entitled to return without having to requalify for admission so long as the student (a) returns after a cumulative absence of no more than five years and (b) notifies the appropriate admissions office of the intent to return to the university not later than three years after the completion of military service obligation. The student may return to the university in the same program of study. With the consultation of an adviser, a comparable program of study may be chosen for discontinued programs.

Veterans Access, Choice and Accountability Act of 2014

codified in 38USC3679(c)

The following individuals shall be charged a rate of tuition not to exceed the in-state rate for tuition and fees purposes:

- A veteran using educational assistance under either chapter 30 (Montgomery G.I. Bill – Active Duty Program) or chapter 33 (Post-9/11 G.I. Bill), of title 38, United States Code, who lives in Virginia while attending a school located in Virginia (regardless of his/her formal state of residence) and enrolls in the school within three years of discharge or release from a period of active duty service of 90 days or more

- Anyone using transferred Post-9/11 GI Bill benefits (38 U.S.C. § 3319) who lives in Virginia while attending a school located in Virginia

(regardless of his/her formal state of residence) and enrolls in the school within three years of the transferor's discharge or release from a period of active duty service of 90 days or more

- Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters or terms) at the same school. The person so described must have enrolled in the school prior to the expiration of the three year period following discharge or release as described above and must be using educational benefits under either chapter 30 or chapter 33, of title 38, United States Code
- Anyone using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311(b)(9)) who lives in Virginia while attending a school located in Virginia (regardless of his/her formal state of residence)
- Anyone using transferred Post-9/11 G.I. Bill benefits (38 U.S.C. § 3319) who lives in Virginia while attending a school located in Virginia (regardless of his/her formal state of residence) and the transferor is a member of the uniformed service who is serving on active duty

The policy shall be read to be amended as necessary to be compliant with the requirements of 38 U.S.C. 3679 as amended.

Tuition determination and student classification

Tuition is determined by the number of credit hours a student is taking, the student's residency classification, course of study and classification level.

In-state residency

Eligibility for in-state tuition benefits is determined by Section 23-7.4 of the Code of Virginia. Refer to the Determination of student classification for in-state tuition purposes (p. 15) in the About VCU section of this bulletin for the complete code.

All applicants to VCU who want to be classified as Virginia residents must complete the application for Virginia in-state tuition rates included in the application for admission. The residency determination of the applicant will be conveyed at the time of admission. New and continuing students initially classified as non-Virginians for tuition purposes may request a review of the initial residency determination by completing an application for change of domicile available from the Office of Records and Registration (online). The student must present clear and convincing evidence that he or she is not residing in the state primarily to attend school. The application deadline is 30 days prior to the start of the semester, and it is the responsibility of the student to establish or to file an appeal to change his/her residency classification prior to the start of classes for the semester under consideration. In accordance with the Code of Virginia, applications received after the start of the semester must be considered for the next semester. Submit completed applications with documentation to the university residency appeals officer. Processing may require four to six weeks; therefore it is strongly recommended that applications be submitted earlier than the stated deadline.

The university's service to students is limited to assuring that they understand the procedures for appealing and that they have access to information about the relevant sections of the Code of Virginia. VCU provides information about the steps of the process and access to the applicable sections of the statute and the associated guidelines. The university also provides qualified staff to review the appeals and make decisions based on the information students provide. The office cannot provide advisement to students as to how to present their case for review; staff members cannot become the student's advocate since their office must make the decision.

Students approved for a change to in-state status for tuition purposes are notified by mail with copies of their approval letters sent to the Office of Financial Aid and the Student Accounting Department. Students denied this status also are notified by mail. The denial letter informs the student of procedures for appeal of this decision, to include filing an appeal with the University Residency Appeals Committee. Students who submit fraudulent applications, falsify documentation or conceal information will be subject to reclassification, payment of all nonresident fees owed and university discipline.

Please note that a student with in-state status for tuition purposes who exceeds 125 percent of the credit hours needed to complete his program will be assessed a tuition surcharge.

Off-campus graduate instruction

VCU is dedicated to serving the needs of Virginians by providing off-campus graduate credit instruction when and where it is needed. Courses are offered in response to an expression of need from various locales and groups.

Off-campus instruction features the same course work available on campus, and most off-campus courses are fully degree-applicable within the admission standards of the Graduate School. **The official policies and procedures of the University Graduate Council, as published on this Graduate Bulletin website and on the Graduate School website, are fully applicable to all off-campus graduate programs and graduate students.**

Tuition for most off-campus classes is the same as other university classes; however, students in off-campus credit classes are not charged university or activity fees.

For additional information on off-campus credit instruction, contact Edward Howard, director of continuing studies, Division of Community Engagement, 920 W. Franklin St., Richmond, VA 23284-3062, telephone (804) 828-8819, or visit the Division of Community Engagement website at community.vcu.edu (http://www.community.vcu.edu).

Undergraduate students in graduate classes

VCU undergraduates may enroll in 500-level courses with approval of their advisers and consent of the programs offering the courses. Highly qualified undergraduates approaching the last year of study may petition to enroll in a maximum of two 600-level graduate courses during the senior year of undergraduate study. Permission to enroll as an undergraduate in 600-level graduate courses must be obtained from the undergraduate academic adviser and the Graduate School. The total load must not exceed 16 hours of combined credit. Credit for any course is applicable toward only one degree unless a student is admitted to a course of study that allows a defined number of shared courses. Undergraduate students seeking permission to enroll in 600-level courses must have a minimum undergraduate overall and major grade point average of 3.0.

For undergraduate students repeating 500-level graduate courses, the undergraduate historical repeat policy (http://bulletin.vcu.edu/academic-regs/ugrad/repeated-courses) applies only if the course is applied toward the undergraduate degree. A historical repeat may not be processed for 600-level courses.

Revised 5/11/2010; 5/14/2013
University Graduate Council

Accelerated bachelor's-to-master's programs

VCU offers a number of accelerated bachelor's-to-master's degree programs in which highly qualified undergraduate students can earn both degrees in a minimum of five years by taking approved graduate-level courses during the senior year of their undergraduate programs. Accelerated bachelor's-to-master's degree programs must be approved by both the University Undergraduate Curriculum Committee and the University Graduate Council. Full descriptions for accelerated programs are included in the Graduate Bulletin and are also accessible through the program index.

Undergraduates who are interested in and qualified for admission to accelerated programs must apply for admission to graduate study and be accepted before they begin the equivalent of the senior year of undergraduate study. Once accepted, they may enroll in the shared graduate course work identified in the approved curriculum (or in the student's plan of study that must be approved at the time of admission). Graduate 600-level course work that has not been identified as part of the shared course work should not be taken until the shared graduate course work has been completed and the student's status has changed from undergraduate to graduate. No 600-level graduate course work may be taken before the senior year. No undergraduate course work may be counted toward the master's degree.

Students in accelerated bachelor's-to-master's programs who do not achieve minimum grades of C in the shared graduate course work identified in the approved curriculum (or the student's plan of study approved at the time of admission) must be reviewed for possible dismissal from the accelerated program as well as the graduate degree program, if applicable. If allowed to continue in the accelerated program, the grades received in these courses will be counted toward both the undergraduate and graduate degree programs and in the calculation of both the undergraduate and graduate grade-point averages. Substitutions for any of the shared graduate course work must be approved by the undergraduate and graduate advisers before the last day of add/drop registration of the semester in which the student wishes to take the substituted course(s).

COLLEGE OF ENGINEERING

Since its inception as a school in 1996, the now-College of Engineering at VCU has brought innovative, real-world engineering education to Central Virginia. The college currently teaches nearly 2,000 undergraduate students and approximately 300 graduate students. Students can earn B.S., M.S. and Ph.D. degrees through the departments of Biomedical Engineering, Chemical and Life Science Engineering, Computer Science, Electrical and Computer Engineering, and Mechanical and Nuclear Engineering.

Engineering skills alone do not equal success in the 21st century. The college challenges students to think bigger and actively collaborate with community businesses and students from a wealth of backgrounds — such as graphic design, physics and health care. Cross-disciplinary focus areas include sustainability and energy engineering, micro- and nano-electronic systems, pharmaceutical engineering, mechanobiology and regenerative medicine, security and mining of big data, and device design and development.

Students also benefit from close, personal interactions with faculty and from the many opportunities available for internships, cooperative education and undergraduate research experiences. Interdisciplinary research opportunities are offered through various state-of-the-art facilities, including the college's Nanomaterials Core Characterization Facility, the Institute for Engineering and Medicine, the Wright-Virginia Microelectronics Center, the dean's undergraduate research initiative and the da Vinci Center. To learn more, visit egr.vcu.edu (http://www.egr.vcu.edu).

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Associate dean for undergraduate studies

Zvi Schwartz, Ph.D., D.M.D.
Associate dean for strategic initiatives

Ram B. Gupta, Ph.D.
Associate dean for faculty research development

Accreditation

The Biomedical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Chemical and Life Science Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Computer Science program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

The Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

The Nuclear Engineering option in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Degree programs

The College of Engineering offers the following degree programs:

Bachelor of Science

Biomedical Engineering
Chemical and Life Science Engineering
Computer Engineering
Computer Science
Electrical Engineering
Mechanical Engineering

- Mechanical Engineering with a concentration in nuclear engineering

Students also may be admitted under "undeclared engineering" for entrance to the College of Engineering. A field of study can be determined after the first semester. Students in undeclared engineering are subject to the change of major criteria listed by each department.

Master of Science

Biomedical Engineering
Computer Science
Engineering

- Engineering with a concentration in chemical and life science engineering
- Engineering with a concentration in electrical and computer engineering

Mechanical and Nuclear Engineering

Doctor of Philosophy

Biomedical Engineering
Engineering

- Engineering with a concentration in chemical and life science engineering
- Engineering with a concentration in computer science

- Engineering with a concentration in electrical and computer engineering

Mechanical and Nuclear Engineering

Joint degree

M.D./Ph.D. in Biomedical Engineering in participation with the School of Medicine

Interdisciplinary and cooperative studies degree

M.S. degree through the Commonwealth Graduate Engineering Program

Post-baccalaureate certificates

Computer Science
Cybersecurity
Data Science

Commonwealth Graduate Engineering Program

The Commonwealth Graduate Engineering Program is a collaborative effort of the University of Virginia, Virginia Commonwealth University, Virginia Polytechnic Institute and State University, Old Dominion University, and George Mason University. The University of Mary Washington participates as a funded receive site.

See the College of Engineering Graduate Programs section of this bulletin for information on VCU's graduate programs in engineering.

Administration

Gregory Triplett, Ph.D.
Associate dean for graduate studies

The VCU Commonwealth Graduate Engineering Program director works closely with the other CGEP directors, the VCU Dean of the College of Engineering, and local businesses and industries.

Program description

Students who have baccalaureate degrees in engineering or strong backgrounds in the sciences may work toward a master's degree in engineering at VCU. Graduate engineering courses are available from the CGEP member universities via interactive television, the Web and two-way audio/video teleconferencing. In addition to the required engineering courses, elective courses are available in applied mathematics, mathematical statistics, chemistry, operations research and physics in classes at VCU. The following academic programs are available through CGEP.

- Chemical Engineering
- Civil and Environmental Engineering
- Computer Science
- Electrical and Computer Engineering
- Engineering Management
- Industrial and Systems Engineering
- Manufacturing and Design Engineering
- Materials Sciences and Engineering
- Mechanical and Aerospace Engineering
- Modeling and Simulation

Degree-seeking students

Students enrolling in the program should apply for admission in a given academic area of study and may select courses from any of the participating institutions, consistent with selected degree requirements.

Nondegree-seeking students

Qualified individuals may enroll in a particular course without pursuing a formal degree program of study. Admission will be based on the individual's academic preparation and the availability of space.

Admission requirements

Students should apply for admission to the CGEP university offering the desired degree program. Applicants should have a B average, but a successful professional experience may strengthen admission credentials. Three recommendations from persons who are qualified to give information concerning the applicant's probable success in the program and the completion of the Graduate Record Examination also are required.

Graduate information

Registration for graduate study

In the biomedical engineering program, all new students begin their course of study in the fall semester (August). Spring semester admissions require the recommendation of the graduate program director and consent of the chair and the associate dean for graduate studies.

Students may begin a course of study in either the fall or spring semesters for other engineering and computer science graduate programs; however, a start in the fall semester is preferred. For the CGEP, students may begin a course of study in either the fall or spring semester.

Engineering, Doctor of Philosophy (Ph.D.)

Note: Admission to this program is temporarily suspended.

Program goal

The goal of the Ph.D. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge; an in-depth original research experience at the frontiers of engineering; and skills for lifelong learning and professional development. Graduates of this program will pursue careers in research and development or academia.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences in order to respond directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications so that engineers, researchers and professors will be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems stemming from the realization that new knowledge and new solutions to

existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

Graduates of the Ph.D. in Engineering degree program will be able to demonstrate:

1. The ability to apply advanced knowledge of mathematics, science or engineering
2. The ability to communicate effectively
3. The ability to identify, formulate and solve engineering problems
4. The ability to identify pertinent research problems, to formulate and execute a research plan, to generate and analyze research results, and to communicate those results through oral presentations and written publications. Graduates will be able to creatively solve the research problems posed.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jun 1 (Feb 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL required for international students

Special requirements

Students may begin a course of study in either the fall or spring semesters for the engineering programs, although a start in the fall semester is preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the doctoral degree in engineering must have a B.S. degree in engineering or a closely related discipline.

Note: Admission to this program is temporarily suspended.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students entering the doctoral program with a B.S. degree, but not the M.S., will require a minimum of 60 post-baccalaureate credit hours beyond the bachelor's degree, including research credit hours (30 for M.S. level and an additional 30 for Ph.D. level).

Students holding the master's degree must complete a minimum of six credit hours in concentration course work, three credit hours in elective course work and 21 credit hours in dissertation research. The student's adviser must approve all course work. Ph.D. students must take a minimum of 30 credit hours (including research credit hours) beyond the master's degree. At least half of the credit hours required in the student's program must be those designated as exclusively for graduate students, that is, those at the 600 level or above.

A minimum of three years of study, including research, is necessary to complete all requirements for the Ph.D. A period of residence of at least three consecutive semesters is required. Residency is defined as registration for at least nine credit hours per semester. Students

have a maximum of eight calendar years, beginning at the time of first registration to complete the Ph.D. degree program.

Comprehensive examinations

In order to advance to doctoral candidacy, the student must pass both written and oral comprehensive examinations. The written examination focuses on the subject matter deemed critical as a foundation in the program. The examination is largely based on material covered in required course work and its application to theoretical and practical problems. The oral examination, which follows successful completion of the written examination(s), is administered to assess the ability of the student to integrate information and display an appropriate mastery of problem-solving capabilities. Graduate students may not take the comprehensive exam if their overall GPA is less than 3.0. Students must also have a minimum GPA of 3.0 for courses within the program in order to take the comprehensive exam. For further details, see the graduate program director or the program chair.

Admission to degree candidacy

Before admission to doctoral candidacy, students must have:

1. Completed required course work
2. Successfully completed the comprehensive examinations
3. Fulfilled all additional departmental requirements

A student may seek admission to candidacy for the Doctor of Philosophy degree without first completing the research and thesis portion of the Master of Science degree.

Dissertation research

The student must conduct a substantial original investigation under the supervision of the permanent adviser and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge.

When the dissertation has been completed, copies in accepted form and style are submitted to the members of the advisory committee. The committee members decide upon the acceptability of the candidate's dissertation. A favorable unanimous vote is required to approve the dissertation and all examiners are required to vote.

If the advisory committee accepts the dissertation for defense, the candidate appears before them for a final oral examination. This examination is open to all members of the faculty. The final oral examination will be limited to the subject of the candidate's dissertation and related matters. A favorable vote of the candidate's advisory committee and no more than one negative vote shall be required for passing the final oral examination. All committee members must vote. There shall be an announcement of the candidate's name, department and title of dissertation, together with the day, place and hour of the final oral examination at least 10 working days in advance.

There are three components of each Ph.D. in Engineering curriculum:

1. Concentration-specific component: This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.
2. Electives component: This component allows the student to take courses in either engineering or science with approval of the student's adviser.
3. Directed research component: This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.

Curriculum requirements

M.S. to Ph.D. in Engineering

Course	Title	Hours
Concentration-specific component: ENGR course work		6
Electives: engineering or science course work		3
ENGR 697	Directed Research	21
Total Hours		30

Total graduate credit hours required (minimum) 30

B.S. to Ph.D. in Engineering

Course	Title	Hours
Concentration-specific component: ENGR course work		18
Electives: engineering or science course work		15
ENGR 697	Directed Research	27
Total Hours		60

Total graduate credit hours required (minimum) 60

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Program website: egr.vcu.edu/future-students/graduate-programs (http://www.egr.vcu.edu/future-students/graduate-programs)

Engineering, Doctor of Philosophy (Ph.D.) with a concentration in chemical and life science engineering

Program mission

The mission of the Ph.D. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge, an in-depth original research experience at the frontiers of engineering, and skills for lifelong learning and professional development. Graduates of this program will pursue careers in research and development or academia.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and

at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
4. Demonstrate abilities in research: Graduates will demonstrate the ability to identify pertinent research problems, to formulate and execute a research plan, to generate and analyze research results, and to communicate those results through oral presentations and written publications. Graduates will be able to creatively solve the research problems posed.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	International students require TOEFL (a minimum score of 100 in the TOEFL exam is required to be considered for financial assistance)

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the chemical and life science engineering concentration must have a B.S. degree in chemical engineering or a closely related discipline.

Acceptance of an applicant is based upon the recommendation of the admissions committee with approval of the program chair and the College of Engineering's associate dean for graduate studies.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

A minimum of 60 credit hours beyond the bachelor's degree, including research credit hours, is required for the Ph.D. in Engineering. Students holding the master's degree must complete a minimum of six credit hours in concentration course work and 18 credit hours in dissertation research. The student's adviser must approve all course work. Ph.D. students must take a minimum of 30 credit hours (including research) beyond the master's degree. No elective courses may be used for both M.S. and Ph.D.

degrees. At least half of the credit hours required in the student's program must be those designated as exclusively for graduate students, that is, at the 600 level or above.

A minimum of three years of study, including research, is necessary to complete all requirements for the Ph.D. A period of residence of at least three consecutive semesters is required. Residency is defined as registration for at least nine credits per semester. A time limit of eight calendar years, beginning at the time of first registration, is placed on work to be credited toward the Ph.D.

Ph.D. qualifying examinations

In order to advance to doctoral candidacy, the student must pass the written qualifying examination. The written examination focuses on the subject matter deemed critical as a foundation in the program. The examination is largely based on material covered in required course work and its application to theoretical and practical problems. The written examination also assesses the ability of the student to integrate information and display an appropriate mastery of problem-solving capabilities and technical writing. Graduate students may not take the comprehensive exam if their overall GPA is less than 3.0. Students must also have a minimum GPA of 3.0 for courses within the program in order to take the comprehensive exam. For further details, see the graduate program director or the program chair.

Admission to candidacy

Before admission to doctoral candidacy, students must have:

1. Completed required course work
2. Successfully completed the comprehensive examinations
3. Fulfilled all additional departmental requirements

A student may seek admission to candidacy for the Doctor of Philosophy degree without first completing the research and thesis portion of the Master of Science degree.

Dissertation research

The student must conduct a substantial original investigation under the supervision of the permanent adviser and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge.

When the dissertation has been completed, copies in accepted form and style are submitted to the members of the advisory committee. The committee members decide upon the acceptability of the candidate's dissertation. A favorable unanimous vote is required to approve the dissertation and all examiners are required to vote.

If the advisory committee accepts the dissertation for defense, the candidate appears before them for a final oral examination. This examination is open to the public. The final oral examination will be limited to the subject of the candidate's dissertation and related matters. A favorable vote of the candidate's advisory committee and no more than one negative vote shall be required for passing the final oral examination. All committee members must vote. There shall be an announcement of the candidate's name, department and title of dissertation, together with the day, place and hour of the final oral examination at least 10 working days in advance.

Curriculum requirements

M.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component		
This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		
Core courses (choose three)		9
CLSE 650	Quantitative Analysis in Chemical and Life Science Engineering	
CLSE 654	Equilibrium Analysis in Chemical and Biological Systems	
CLSE 655	Nonequilibrium Analysis in Chemical and Life Science Engineering	
CLSE 656	Advanced Chemical Reaction Engineering	
Directed research		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		21
CLSE 690	Research Seminar in Chemical and Life Science Engineering	
CLSE 697	Directed Research in Chemical and Life Science Engineering	
Total Hours		30

Total graduate credit hours required (minimum) 30

Students entering the doctoral program with a B.S. degree, but not the M.S., will require a minimum of 60 post-baccalaureate credit hours (30 for M.S. level and an additional 30 for Ph.D. level).

B.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component - CLSE course work		
This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		
CLSE 650	Quantitative Analysis in Chemical and Life Science Engineering	3
CLSE 654	Equilibrium Analysis in Chemical and Biological Systems	3
CLSE 655	Nonequilibrium Analysis in Chemical and Life Science Engineering	3
CLSE 656	Advanced Chemical Reaction Engineering	3
Additional CLSE course work at the 500 level or higher		9
Option electives - engineering or science course work		
This component allows the student to take courses in either engineering or science with approval of the student's adviser (e.g. CLSE, ENGR, CHEM courses, 500 level or higher).		12
Directed research		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		27
CLSE 690	Research Seminar in Chemical and Life Science Engineering	

CLSE 697	Directed Research in Chemical and Life Science Engineering	
Total Hours		60

Total graduate credit hours required (minimum) 60

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Engineering, Doctor of Philosophy (Ph.D.) with a concentration in computer science

Program mission

The mission of the Ph.D. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge, an in-depth original research experience at the frontiers of engineering, and skills for lifelong learning and professional development. Graduates of this program will pursue careers in research and development or academia.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
4. Demonstrate abilities in research: Graduates will demonstrate the ability to identify pertinent research problems, to formulate and execute a research plan, to generate and analyze research results, and to communicate those results through oral presentations and written publications. Graduates will be able to creatively solve the research problems posed.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL required for international students

Special requirements

- Acceptance of an applicant is based upon the recommendation of the admissions committee with approval of the program chair and the associate dean for graduate studies.
- Students may begin a course of study in either the fall or spring semesters for the engineering graduate programs, although a start in the fall semester is preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34), and the College of Engineering, applicants must meet the following requirements:

Applicants to the Ph.D. in Engineering with a concentration in computer science must have an M.S. degree in computer science or a field closely related to computer science, such as mathematics, physics, engineering or bioinformatics. Outstanding students (preferably with a B.S. degree in computer science) can be admitted into the direct B.S. to Ph.D. program.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

A minimum of 60 credit hours beyond the bachelor's degree (typically a minimum of four years), or 30 credits beyond a master's degree (typically a minimum of three years), including research credits, is required for the Ph.D. in Engineering. Students may not present courses receiving grades less than C for fulfilling degree requirements and can only present up to six credit hours of course work receiving a grade of C.

A period of residence of at least three consecutive semesters is required. Residency is defined as registration for at least nine credits per semester. A time limit of eight calendar years, beginning at the time of first registration, is placed on work to be credited toward the Ph.D.

Up to 30 percent of a student's required non-research graduate-level credits can be transferred into the Ph.D. program from another college or university. No more than 30 percent of student's non-research credits in graduate-level courses taken at VCU before admission to the Ph.D. program may be counted toward the Ph.D. degree.

A student will pursue a Ph.D. under the guidance of a computer science graduate faculty member who will serve as the dissertation adviser. Interdisciplinary programs of study that involve computer science and another discipline are encouraged; however, a core of computer science courses is required. Courses not labeled CMSC must show relevance to the student's program of study and must be submitted for approval by the dissertation adviser. The advisory committee will conduct an annual review of student progress, with written minutes of committee recommendations prepared by student and signed by all advisory committee members.

The detailed requirements depend on the student's academic background.

Students with an M.S. in Computer Science or in a closely related field must take a minimum of 12 credit hours of didactic course work at the graduate level and 18 credit hours of directed research for a minimum of 30 credits.

- A minimum of four courses that should satisfy the following:
  - At least two courses at the 600 level or greater
  - At least one course from each of the following two foundational areas: theory and systems.

In addition, a student admitted to this program may need to take other undergraduate computer science courses in order to prepare for the required graduate-level courses. The choice of these courses will be left to the discretion of the student's adviser.

Other students, including those with only a B.S. degree, must take a minimum of 60 credit hours of course work.

- A minimum of 33 didactic credits, including
  - At least two courses from each of the three foundational areas: theory, systems and applied computer science (CMSC 501 **must** be one of these courses.)
  - At least 17 credits at the 600 level or greater

In addition, a student admitted to this program may need to take other undergraduate computer science courses in order to prepare for the required graduate-level courses. The choice of these courses will be left to the discretion of the student's adviser.

A minimum of 18 credits of directed research is required.

The Ph.D. program is independent from the M.S. in Computer Science program. Credits earned while in the Ph.D. program cannot be used to satisfy the requirements of the M.S. in Computer Science degree. Students admitted to the Ph.D. program cannot switch to the M.S. in Computer Science program and cannot obtain an M.S. in Computer Science degree in addition to the Ph.D. degree. In exceptional circumstances, the computer science graduate committee may allow a student to graduate with an M.S. degree instead of the Ph.D. degree based on a petition submitted to the committee by the student's adviser; students cannot petition for it.

Comprehensive examinations

Before advancing to doctoral candidacy, the student must pass both qualifying and oral comprehensive examinations.

Qualifying comprehensive examination

The qualifying examination focuses on the subject matter deemed critical as a foundation in the program.

- **The examination is largely based on material covered in required course work and its application to theoretical and practical problems.**
- The examination will cover knowledge in three areas, and in order to pass students must score a minimum of 75 percent in each area.

  - The exam must include material based on CMSC 501 from the theory area and on at least one course from the systems foundational area.
  - The third is the area of specialization based on courses to be decided by the dissertation adviser.
- Students are allowed to take the comprehensives based on courses they may not have taken at VCU, however, they have to satisfy the course requirements as mentioned above.
- Students can contact the lead professor for any area and obtain a list of topics that will be covered in the exam.
- The exam will be conducted a minimum of once a year and will be organized by the graduate director, with prior approval of the exam questions by the graduate committee.
- A student who fails the qualifying comprehensive exam is allowed one more attempt to pass it. The re-examination requires the approval of the student's advisory committee. A student who fails one area of the required three comprehensive exam areas must retake the exam in the failed area within the following year. The department may organize and schedule, no earlier than 60 days after the failed exam, a special comprehensive exam for such students. A student who fails two or more exam areas must retake the entire comprehensive exam at the regularly scheduled comprehensive exam within the following year.
- Graduate students may not take the comprehensive exam if their overall GPA falls below the minimum of 3.0.

Oral comprehensive examination

The oral examination (proposal defense), which follows only after successful completion of the qualifying examination, is administered to assess the ability of the student to integrate information and display an appropriate mastery of problem-solving capabilities. The student is required to prepare a written proposal of original research and to defend it in front of the dissertation committee.

Admission to candidacy

Before admission to doctoral candidacy, students must have:

1. Completed required course work (students who entered the program through the B.S. entry point may be admitted to candidacy with six credit hours of electives not completed yet)
2. Successfully completed the comprehensive examinations

Dissertation research

The student must conduct a substantial original investigation under the supervision of the permanent adviser and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. There should be a student advisory committee meeting no later than three months prior to dissertation defense to certify student readiness to write, and this should be signed by all advisory committee members. When the dissertation has been completed, copies in accepted form and style are submitted to the members of the advisory committee.

Final dissertation defense

If the advisory committee accepts the dissertation for defense, the candidate appears before them for a final oral examination. This examination is open to all members of the faculty and students.

Since the Ph.D. is awarded for completion of work on an original research problem, peer-reviewed evidence of the quality of this work, in terms of at least one accepted journal paper or published high-quality conference paper (publications should be in a student's research area), must be approved by the dissertation committee and the graduate committee before the final oral examination can be scheduled. Specific publication requirements are available at the computer science department website as well as in the College of Engineering graduate handbook.

The final oral examination will be limited to the subject of the candidate's dissertation and related matters. A favorable vote of the candidate's advisory committee and no more than one negative vote shall be required for passing the final oral examination. All committee members must vote. There shall be an announcement of the candidate's name, department and title of dissertation, together with the day, place and hour of the final oral examination at least 10 working days in advance.

Curriculum requirements

B.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component		
This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		
Foundational area: theory		
CMSC 501	Advanced Algorithms (required)	3
Select at least one of the following:		3
CMSC 510	Regularization Methods for Machine Learning	
CMSC 512	Advanced Social Network Analysis and Security	
CMSC 526	Theory of Programming Languages	
CMSC 591	Topics in Computer Science [1]	
CMSC 601	Convex Optimization	
CMSC 620	Applied Cryptography	
CMSC 621	Theory of Computation	
CMSC 630	Image Analysis	
CMSC 678	Statistical Learning and Fuzzy Logic Algorithms	
CMSC 691	Special Topics in Computer Science [1]	
Foundational area: systems		
Select at least two of the following:		6
CMSC 502	Parallel Algorithms	
CMSC 506/ EGRE 526	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 591	Topics in Computer Science [1]	
CMSC 603	High Performance Distributed Systems	
CMSC 605	Advanced Computer Architecture	
CMSC 608	Advanced Database	
CMSC 615	Cryptocurrency and Blockchain Techniques	
CMSC 618	Database and Application Security	
CMSC 622	Network and Operating Systems Security	
CMSC 628	Mobile Networks: Applications, Modeling and Analysis	
CMSC 691	Special Topics in Computer Science [1]	

Foundational area: applied computer science		
Select at least two of the following:		6
CMSC 516	Advanced Natural Language Processing	
CMSC 591	Topics in Computer Science [1]	
CMSC 609	Advanced Computational Intelligence	
CMSC 610	Algorithmic Foundations of Bioinformatics	
CMSC 612	Game Theory and Security	
CMSC 623	Cloud Computing	
CMSC 635	Knowledge Discovery and Data Mining	
CMSC 636	Artificial Neural Networks and Deep Learning	
CMSC 691	Special Topics in Computer Science [1]	
Additional CMSC course work, other engineering or science courses		15
Note: At least 17 credit hours of all courses must be at the 600 level or greater.		
Directed research component		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		
CMSC 697	Directed Research	18
Additional course work or directed research		9
Total Hours		60

Total graduate credit hours required (minimum) 60

M.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component		
This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		
Foundational area: theory		
Select at least one of the following:		3
CMSC 501	Advanced Algorithms	
CMSC 510	Regularization Methods for Machine Learning	
CMSC 512	Advanced Social Network Analysis and Security	
CMSC 526	Theory of Programming Languages	
CMSC 591	Topics in Computer Science [1]	
CMSC 601	Convex Optimization	
CMSC 620	Applied Cryptography	
CMSC 621	Theory of Computation	
CMSC 630	Image Analysis	
CMSC 678	Statistical Learning and Fuzzy Logic Algorithms	
CMSC 691	Special Topics in Computer Science [1]	
Foundation area: systems		
Select at least one of the following:		3
CMSC 502	Parallel Algorithms	
CMSC 506/ EGRE 526	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 591	Topics in Computer Science [1]	
CMSC 603	High Performance Distributed Systems	
CMSC 605	Advanced Computer Architecture	
CMSC 608	Advanced Database	
CMSC 615	Cryptocurrency and Blockchain Techniques	
CMSC 618	Database and Application Security	
CMSC 622	Network and Operating Systems Security	
CMSC 628	Mobile Networks: Applications, Modeling and Analysis	
CMSC 691	Special Topics in Computer Science [1]	
Additional CMSC course work, other engineering or science courses		6
Note: At least six credit hours of all courses must be at the 600 level or greater.		
Directed research component		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		
CMSC 697	Directed Research	18
Total Hours		30

[1] Only selected sections of CMSC 591 and CMSC 691 count toward individual foundational areas. An up-to-date list of sections of these topics courses, including their assignments to foundational areas, is available at computer-science.egr.vcu.edu/graduate/computer-science.

Total graduate credit hours required (minimum) 30

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Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Engineering, Doctor of Philosophy (Ph.D.) with a concentration in computer science/Computer Science Ph.D. with the University of Cordoba [dual degree]

Program mission

The mission of the Ph.D. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge, an in-depth original research

experience at the frontiers of engineering, and skills for lifelong learning and professional development. Graduates of this program will pursue careers in research and development or academia.

Program goals

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
4. Demonstrate abilities in research: Graduates will demonstrate the ability to identify pertinent research problems, to formulate and execute a research plan, to generate and analyze research results, and to communicate those results through oral presentations and written publications. Graduates will be able to creatively solve the research problems posed.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL required for international students

All applicants to the dual-degree Ph.D. program with VCU and the University of Córdoba must meet all general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering. Applicants to the dual-degree Ph.D. program are selected from among the students already enrolled in either VCU's Ph.D. in Engineering computer science concentration or in the University of Cordoba's Ph.D. in Computer Science. The selection will be performed by the dual-degree Ph.D. program steering committee consisting of the chair and graduate program director of computer science at VCU and the chair and graduate program director of computer science at UCO.

Students need to apply to the dual-degree program after already being enrolled in the doctoral program at either VCU or UCO and before passing the oral comprehensive examination. Students must have identified a dissertation adviser (and a co-adviser from the other institution).

To be admitted to the dual-degree program, VCU students must hold an M.S. degree in computer science with a minimum GPA of 3.0. To be admitted to the UCO Ph.D. program and into the dual-degree program, UCO students must fulfill the following requirements with regard to academic qualifications:

1. Applicants with degrees in engineering or architecture or any degree with 240 ECTS credits must have completed a research master's degree, including at least 16 ECTS credits for training in methodology and research, as well as a research dissertation.
2. Applicants with degrees in engineering or architecture or any degree with 240 ECTS credits who have completed a non-research master's degree (i.e. professional master's degree) must have completed additional training at the doctoral level in methodology and research equivalent to16 ECTS credits, as well as a research project equivalent to 16 ECTS credits.
3. Graduates who have completed degrees, in accordance with EU law, worth a minimum of 300 ECTS credits, must have completed additional training at the doctoral level in methodology and research equivalent to 16 ECTS credits, as well as a research project equivalent to16 ECTS credits.
4. Applicants with university qualifications who, prior to obtaining a place on a specialized health training course, have successfully completed at least two years of training as part of a program leading to an official qualification in any health sciences specialty, may be admitted directly or may be required to complete additional doctoral training as established by the academic committee for the doctoral program.
5. Applicants already holding doctorates under earlier university regulations or holding diplomas in advanced studies in accordance with the provisions of Royal Decree 778/1998 of 30 April, or who have demonstrated sufficient research ability in terms of Royal Decree 185/1985 of 23 January, may be admitted directly or may be required to complete additional doctoral training as established by the academic committee for the doctoral program.
6. Applicants holding master's degrees awarded in accordance with foreign education systems may be admitted to doctoral study without needing to have their degrees officially recognized, once the University of Córdoba has established that their degrees demonstrate a level of training equivalent to that provided by Spanish master's degrees, including the research training required under the present regulations, and entitles the holder to be admitted to doctoral studies in the country of issue. Admission does not, under any circumstances, imply official recognition of any previous degree held by the applicant, nor recognition for any purposes other than that of admission to doctoral study.
7. VCU students must complete all VCU Ph.D. degree requirements before the Ph.D. degree from the University of Cordoba may be awarded.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

A minimum of 30 graduate credit hours beyond the M.S. degree, including research credit, is required at VCU for the Ph.D. in Engineering with a concentration in computer science. Students must complete a minimum of 12 graduate credits hours (i.e., four courses) of didactic course work and 18 graduate credit hours of dissertation research. At least half of the 12 didactic credits required must be at the 600 level or above. No elective courses may be used for both M.S. and Ph.D. degrees. The student adviser must approve all course work.

A minimum of three years of study, including research, is necessary to complete all requirements for the Ph.D. A period of residence of at least three consecutive semesters is required. Residency is defined as registration for at least nine credits per semester. A time limit of eight calendar years, beginning at the time of first registration, is placed on work to be credited toward the Ph.D.

Students admitted into the Ph.D. program with a B.S. degree should refer to the program page for information on the Ph.D. in Engineering with a concentration in computer science (p. 55).

Didactic course work

VCU and UCO students in the dual-degree Ph.D. program will take four graduate courses: three from VCU (offered by VCU computer science faculty) and one from UCO (offered by UCO computer science faculty) as determined by the steering committee. The VCU courses include all approved graduate-level courses available to VCU computer science doctoral students. The following course is currently offered by UCO. The list of UCO courses will be updated every year by the steering committee.

54-22092014 Evolutionary Algorithms in Data Mining, 3 credit hour

The objective of this course is to introduce students to the field of evolutionary computation, as well as its applications to data mining problems. Genetic algorithms and genetic programming as well as evolutionary programming and evolutionary strategies will be covered. The second part of the course will focus on solving relevant problems in the field of data mining such as classification, regression, clustering, association rule mining, subgroup discovery and feature selection with EC approaches. Prerequisites: graduate standing. The course will be offered as an online course.

Foundation areas for computer science graduate studies include theory, systems and applied computer science. By the time of graduation, students must have completed at least one course from each of the following two foundation areas of theory and systems.

VCU faculty will deliver the courses for both VCU and UCO students (to the latter by synchronous broadcasting used currently for delivering M.S. programs to the Naval Surface Warfare Center at Dahlgren, while UCO will deliver its courses (one or more) to UCO and VCU students as asynchronous online course(s).

The courses will have identical names and will be cross-listed in the VCU and UCO bulletins and will be open to all VCU and UCO computer science students as long as there is at least one student from the dual-degree Ph.D. program enrolled in the course.

Students will register for the four required graduate courses at their universities and will pay their university tuition and fees, in spite of the fact that some will be delivered by the other university.

Dissertation committee

The dual-degree Ph.D. program dissertation committee will consist of the main adviser (from one university) and one co-adviser (from the other university) plus six members, three from VCU and three from UCO,

for a total of eight members. The committee will be formed during the semester in which the student is admitted to the dual-degree program.

Admission to candidacy

Before admission to doctoral candidacy, students must have: (1) completed required course work, (2) successfully passed both written and oral comprehensive examinations and (3) fulfilled all additional departmental requirements.

Qualifying comprehensive examination

1. The qualifying comprehensive exam focuses on the subject matter deemed critical as a foundation in the program and is largely based on material covered in courses and its application to theoretical and practical problems
2. The qualifying comprehensive examination will cover knowledge in three areas and, in order to pass, students must score a minimum of 75 percent in each area.
   a. The exam must include material based on CMSC 501 from the theory area and on at least one course from the systems area.
   b. The third is the area of specialization based on courses to be decided by the dissertation adviser.
3. Students are allowed to take the exam based on courses they may not have taken, however, they still have to satisfy the course requirements as mentioned above.
4. Students may contact the lead professor for any area and obtain a list of topics that will be covered in the exam.
5. The exam will be conducted a minimum of once a year and will be organized by the VCU graduate program director, with prior approval of the exam questions by the graduate committee. The exam will be organized at the same date and time for VCU and UCO students. Students will be taking the exam in their home universities.
6. Students who fail the qualifying comprehensive exam are allowed one additional attempt to pass it. Students who fail one area of the required three qualifying comprehensive exam areas must retake the exam in the failed area within the following year. The department may organize and schedule, no earlier than 60 days after the failed exam, a special comprehensive exam for such students. Students who fail two or more exam areas must retake the entire qualifying comprehensive exam at the regularly scheduled comprehensive exam within the following year.
7. Graduate students may not take the comprehensive exam if their overall GPA is less than 3.0. They also must have a minimum GPA of 3.0 on the courses covering the exam areas.

Oral comprehensive examination

The oral comprehensive exam requires students to prepare a written proposal of original research and to defend it in front of the dissertation committee. The oral comprehensive exam may be taken only after successful completion of the qualifying comprehensive exam.

Dissertation research and defense

During their studies, students must complete 18 credit hours of research at their own institutions. The student must conduct a substantial original investigation under the supervision of the advisers and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge.

When the dissertation has been completed, copies in accepted form and style are submitted to the members of the advisory committee. The committee members decide upon the acceptability of the candidate's dissertation. A favorable unanimous vote is required to approve the dissertation, and all examiners are required to vote.

If the advisory committee accepts the dissertation for defense, the candidate appears before them for a final oral examination. This examination is open to all members of the faculty. The final oral examination will be limited to the subject of the candidate's dissertation and related matters. A favorable vote of the candidate's advisory committee and no more than one negative vote shall be required for passing the final oral examination. All committee members must vote. There shall be an announcement of the candidate's name, department and title of dissertation, together with the day, place and hour of the final oral examination at least 10 working days in advance. The UCO doctoral committee must approve/disapprove the defended dissertation.

International experience

Students, after passing comprehensive exams, will spend six months conducting research at the co-adviser's university. While abroad, the students must maintain full-time student status (to keep benefits such as a stipend) at their home institutions by registering for dissertation research credit hours. They will also need to register for one graduate credit hour at the co-adviser's university. (The UCO student would register for one VCU graduate credit hour while at VCU, and a VCU student for one UCO graduate credit hour while at UCO.) The hosting department is responsible for covering the cost of the one graduate credit-hour registration of the visiting student, in order for the student to qualify for health insurance.

Publication requirement

Students must publish at least one journal paper before the final defense takes place. Since the Ph.D. is awarded for completion of work on an original research problem, peer-reviewed evidence of the quality of this work, in terms of at least one journal paper (in a student's research area), must be approved by the dual-degree program dissertation committee and the graduate committee before the final dissertation defense may be scheduled. Specific publication requirements are available on the Department of Computer Science website as well as in the College of Engineering graduate handbook.

Curriculum requirements

Course	Title	Hours
VCU didactic course work		
Select nine credits from the three areas.		
Foundational area: theory		
Select at least one of the following:		3
CMSC 501	Advanced Algorithms (required)	
CMSC 526	Theory of Programming Languages	
CMSC 620/ CISS 624	Applied Cryptography	
CMSC 621	Theory of Computation	
Foundational area: systems		
Select at least one of the following:		3
CMSC 502	Parallel Algorithms	
CMSC 506/ EGRE 526	Computer Networks and Communications	
CMSC 608	Advanced Database	
CMSC/CISS 618	Database and Application Security	

CMSC 622	Network and Operating Systems Security	
Specialization area		
With dissertation adviser, select an additional three credit hours of CMSC course work or other engineering or science courses in MATH/OPER/STAT/EGRE		3
UCO didactic course work		
Select at least one course from the list of UCO offerings (updated each year by steering committee)		3
Directed research		
CMSC 697	Directed Research	18
Total Hours		30

Total graduate credit hours required (minimum) 30

Typical plan of study

Students must apply to the dual program after being enrolled at either the VCU or UCO doctoral program and before passing the oral comprehensive examination, and must have a dissertation adviser (and a co-adviser from the other institution). The oral comprehensive exam should be completed by the end of the third year. Students must pass the qualifying comprehensive exam before taking the oral comprehensive exam. The plan of study is developed with the student adviser and co-adviser, taking into consideration the student's area of research.

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Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Engineering, Doctor of Philosophy (Ph.D.) with a concentration in electrical and computer engineering

Program mission

The mission of the Ph.D. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge, an in-depth original research experience at the frontiers of engineering, and skills for lifelong learning and professional development. Graduates of this program will pursue careers in research and development or academia.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
4. Demonstrate abilities in research: Graduates will demonstrate the ability to identify pertinent research problems, to formulate and execute a research plan, to generate and analyze research results, and to communicate those results through oral presentations and written publications. Graduates will be able to creatively solve the research problems posed.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL or IELTS is required for international students

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Ph.D. in Engineering with a concentration in electrical and computer engineering must have a B.S. degree in electrical and computer engineering or a closely related discipline. Acceptance of an applicant is based upon the recommendation of the admissions committee with approval of the program chair and the associate dean for graduate studies.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

A minimum of 60 credit hours beyond the bachelor's degree, including research credit hours, is required for the Ph.D. in Engineering. Students holding the master's degree must complete a minimum of six credit hours in concentration course work and 21 credit hours in dissertation research. The student's adviser must approve all course work. Ph.D. students must take a minimum of 30 credit hours (including research) beyond the master's degree. No elective courses may be used for both M.S. and Ph.D. degrees. At least half of the didactic credit hours required in the student's program must be those designated as exclusively for graduate students, that is, at the 600 level or above. Students may not present courses receiving grades lower than B for fulfilling degree requirements. More than six credits of C grades or lower in the student's transcript will be considered unsatisfactory performance and may result in termination from the program.

A minimum of three years of study, including research, is necessary to complete all requirements for the Ph.D. A period of residence of at least three consecutive semesters is required. Residency is defined as registration for at least nine credits per semester. A time limit of eight calendar years, beginning at the time of first registration, is placed on work to be credited toward the Ph.D.

Comprehensive examination (also referred to as the Ph.D. qualifier examination)

In order to advance to doctoral candidacy, the student must pass the comprehensive examination that is composed of written and oral parts. The examination focuses on the subject matter deemed critical as a foundation in the program and in the student's research area. It is based on the material covered in required course work and its application to theoretical and practical problems, as well as assessment of the student's proficiency and ability to comprehend and explain new knowledge in his/her area of study. Graduate students may not take the comprehensive exam if their overall GPA is less than 3.0. Students must also have a minimum GPA of 3.0 for courses within the program in order to take the comprehensive exam. For further details, see the graduate program director or the program chair.

Proposal defense (also referred to as the Ph.D. candidacy examination)

The student should defend his/her research proposal within 36 months of enrollment. The purpose of the proposal defense is to assess the ability of the student to integrate information and display mastery of problem-solving capabilities in the chosen research area. The student is required to prepare a written dissertation proposal and to defend it in front of the doctoral advisory committee. The format of the proposal defense is an oral presentation by the candidate and questions by the doctoral advisory committee during and/or following the presentation. All committee members are required to vote, and a favorable decision with no more than one negative vote is required to pass the proposal defense. All members of the committee should be present at the dissertation proposal defense; in exceptional cases, the defense may go forward with one committee member other than the dissertation adviser absent, but the absent committee member must provide the student an opportunity to present and discuss the proposal before voting. Graduate students may not take the proposal exam if their overall GPA is less than 3.0. Students must also have a minimum GPA of 3.0 for courses within the program in order to take the proposal exam. For further details, see the graduate program director or the program chair.

Admission to candidacy

Before admission to doctoral candidacy, post-master's students must have completed all required course work and post-baccalaureate students must have no more than six credits of elective course work remaining. For candidacy, students must have also passed the comprehensive exam and the proposal defense and fulfilled all departmental requirements.

A student may seek admission to candidacy for the Doctor of Philosophy degree without first completing the research and thesis portion of the Master of Science degree.

Dissertation research

The student must conduct a substantial original investigation under the supervision of the permanent adviser and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge.

When the dissertation has been completed, copies in accepted form and style are submitted to the members of the advisory committee. The committee members decide upon the acceptability of the candidate's dissertation. A favorable unanimous vote is required to approve the dissertation for defense and all members are required to vote.

If the advisory committee accepts the dissertation for defense, the candidate appears before them for a final oral examination. This examination is open to public and is limited to the subject of the candidate's dissertation and related matters. There shall be an announcement of the candidate's name, department and title of dissertation, together with the day, place and hour of the final oral examination at least 10 working days in advance. All members of the doctoral advisory committee must be present at the dissertation defense; in exceptional cases, the defense may go forward if no more than one committee member other than the dissertation adviser is absent, but the absent committee member has to provide the student an opportunity to present and discuss the dissertation before voting. A favorable vote of the candidate's advisory committee, which can include no more than one negative vote, shall be required for passing the final oral examination. All committee members must vote.

Publication requirement

Peer-reviewed evidence of the quality of the dissertation work, in terms of at least one accepted or published reputable journal paper or published high-quality conference paper and a second manuscript submitted to a journal or a high-quality conference, must be approved by the doctoral advisory committee and the ECE graduate program director before the dissertation defense can be scheduled. These publications should be based on the student's dissertation research, with the student as the primary author.

Curriculum requirements

M.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component		
EGRE course work (EGRE 500 level or higher or courses approved by the advisory committee): This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		6
Option electives		
Engineering or science course work (including EGRE, ENGR, EGRB, EGRM, EGMN, CMSC, CLSE, PHYS, MATH, OPER, STAT, CHEM, 500 level or higher or courses approved by the advisory committee): This component allows the student to take courses in either engineering or science with approval of the student's adviser.		3
Directed research		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		21
EGRE 697	Directed Research in Electrical and Computer Engineering	
Total Hours		30

Total graduate credit hours required (minimum) 30

B.S. to Ph.D. curriculum

Course	Title	Hours
Concentration component		
EGRE course work (EGRE 500 level or higher or courses approved by the advisory committee): This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		12
Option electives		
Engineering or science course work (including EGRE, ENGR, EGRB, EGRM, EGMN, CMSC, CLSE, PHYS, MATH, OPER, STAT, CHEM, 500 level or higher or courses approved by the advisory committee): This component allows the student to take courses in either engineering or science with approval of the student's adviser.		21
Directed research		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		27
EGRE 697	Directed Research in Electrical and Computer Engineering	
Total Hours		60

Total graduate credit hours required (minimum) 60

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Program website: electrical-and-computer.egr.vcu.edu/graduate (http://electrical-and-computer.egr.vcu.edu/graduate)

Engineering, Master of Science (M.S.)

Note: Admission to this program is temporarily suspended.

Program goals

The goal of the M.S. in Engineering degree program is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge including business and manufacturing aspects; an in-depth research experience at the frontiers of engineering; and skills for lifelong learning and professional development. Graduates of this program will pursue careers in business/industry and government, or will pursue doctoral degrees.

1. Advanced technical skills: To produce graduates who possess the necessary advanced analytical and technical skills in engineering and sciences in order to respond directly to the higher goals of fulfilling

the needs of industry for effective, productive engineers and of providing economic development for the region, state and nation
2. Communication: To produce graduates who possess a facility with both written and oral communications so that engineers will be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems stemming from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

Graduates of the M.S. in Engineering degree program will be able to demonstrate**:**

1. The ability to apply advanced knowledge of mathematics, science or engineering
2. The ability to communicate effectively
3. The ability to identify, formulate and solve engineering problems

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jun 1 (Feb 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL required for international students

Note: Students may begin a course of study in either the fall or spring semesters for the engineering programs, although a start in the fall semester is preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the master's degree in engineering must have a B.S. degree in engineering or a closely related discipline.

Note: Admission to this program is temporarily suspended.

Degree requirements

Thesis option

In addition to the VCU Graduate School graduation requirements (p. 31), students seeking the M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses (including research). Each student must complete 12 credit hours of concentration-specific course work, 12 credit hours in electives and six credit hours in thesis research. The student's adviser must review and approve all course work and thesis research credit hours. The total of all credit hours must be at least 30. No elective courses may be used for both M.S. and Ph.D. degrees. At least half of the credit hours required in the student's program must be those designated as exclusively for graduate students, that is, those at the 600 level or above.

Each student must conduct an original investigation under the supervision of the permanent adviser and prepare a thesis reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. This study is reported in a thesis prepared in acceptable form and style. Upon approval of the thesis by the adviser,

the student submits a copy to each member of the advisory committee. The student's advisory committee members examine the thesis and decide upon its acceptability. Each committee member reports to the student's adviser when the thesis is acceptable for defense. The thesis is approved for defense only if accepted unanimously. Upon approval of the thesis, the student appears for a final oral examination administered by the student's advisory committee. This examination of an M.S. candidate includes the subject matter of course work as well as the thesis.

There are three components of each M.S. in Engineering thesis curriculum:

1. Concentration-specific component: This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline. Students seeking to take course work and conduct their research in the engineering concentration must contact the graduate program coordinator or department chair of engineering for detailed information about that option.
2. Electives component: This component allows the student to take courses in either engineering or science with approval of the student's adviser. The option can be tailored to meet the individual student's academic goals and research interests.
3. Directed research component: This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.

Non-thesis option

Students seeking the non-thesis M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses. Each student must complete 15 credit hours in concentration course work and 15 credit hours in option electives course work.

Each non-thesis student must have a plan of study by the end of the first semester or prior to completing nine credit hours. This plan of study (and all revisions) must be approved by the student's adviser and the assistant dean for graduate affairs of the College of Engineering. The student's adviser must review/approve all course work in advance of enrollment. At least half the credit hours required in the student's program must be designated as 600 level or above.

There are two components of each M.S. in Engineering non-thesis curriculum:

Concentration-specific component: This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.

Electives component: This component allows the student to take courses in either engineering or science with approval of the student's adviser.

The concentration can be tailored to meet the individual student's academic goals and research interests. Students seeking to take course work and conduct their research in the engineering concentration should contact the appropriate graduate program coordinator or department chair of engineering for detailed information about that option.

Curriculum requirements

Thesis option

Course	Title	Hours
Concentration-specific component: ENGR course work		12
Electives: engineering or science course work		12
ENGR 697	Directed Research	6
Total Hours		30

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Concentration-specific component: ENGR course work		15
Electives: engineering or science course work		15
Total Hours		30

Total graduate credit hours required (minimum) 30

Program contact

Gregory Triplett, Ph.D.
Associate dean of graduate studies, College of Engineering
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(804) 828-5387

Additional contact

Barbara D. Boyan, Ph.D.
Professor and dean, College of Engineering
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Program website: egr.vcu.edu (https://egr.vcu.edu)

Engineering, Master of Science (M.S.) with a concentration in chemical and life science engineering

Program mission

The mission of the M.S. in Engineering degree is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge including business and manufacturing aspects; an in-depth research experience at the frontiers of engineering; and skills for lifelong learning and professional development. Graduates of this program will pursue careers in business/industry and government, or will pursue doctoral degrees.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	International students require TOEFL (A minimum score of 100 in the TOEFL exam is required to be considered for financial assistance.)

Note: Students may begin a course of study in either the fall or spring semester for the engineering programs, although a start in the fall semester is preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the chemical and life science engineering concentration must have a B.S. degree in chemical engineering or a closely related discipline.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

Thesis option

Students seeking the M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses (including research). Each student must complete 12 credit hours in concentration course work, 12 credit hours in concentration electives course work and six credit hours in thesis research. The student's adviser must review and approve all course work and thesis research credit hours. The total of all credit hours must be at least 30. No elective courses may be used for both M.S. and Ph.D. degrees. At least half of the credit hours required in the student's program must be those designated as exclusively for graduate students, that is, those at the 600 level or above.

Each student must conduct an original investigation under the supervision of the permanent adviser and prepare a thesis reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. This study is reported in a thesis prepared in acceptable form and style. Upon approval of the thesis by the adviser, the student submits a copy to each member of the advisory committee. The student's advisory committee members examine the thesis and decide upon its acceptability. Each committee member reports to the

student's adviser when the thesis is acceptable for defense. The thesis is approved for defense only if accepted unanimously. Upon approval of the thesis, the student appears for a final oral examination administered by the student's advisory committee. This examination of an M.S. candidate includes the subject matter of course work as well as the thesis.

Non-thesis option

Students seeking the non-thesis M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses. Each student must complete 15 credit hours in concentration course work and 15 credit hours in option electives course work.

Each non-thesis student must have a plan of study by the end of the first semester or prior to completing nine credit hours. This plan of study (and all revisions) must be approved by the student's adviser and the assistant dean for graduate affairs of the College of Engineering. The student's adviser must review/approve all course work in advance of enrollment. At least half the credit hours required in the student's program must be designated as 600 level or above.

Curriculum requirements

There are three components of each M.S. in Engineering option:

1. **Concentration (option-specific) component:** This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.
2. **Option electives component:** This component allows the student to take courses in either engineering or science with approval of the student's adviser (e.g. CLSE, ENGR, CHEM courses at 500 level or higher)
3. **Directed research component:** This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.

The option can be tailored to meet the individual student's academic goals and research interests. Students seeking to take course work and conduct their research in the chemical and life science engineering concentration should contact the graduate program coordinator or department chair of chemical and life science engineering for detailed information about that concentration.

Thesis option

Course	Title	Hours
Concentration component - CLSE course work		
CLSE 650	Quantitative Analysis in Chemical and Life Science Engineering	3
CLSE 654	Equilibrium Analysis in Chemical and Biological Systems	3
CLSE 655	Nonequilibrium Analysis in Chemical and Life Science Engineering	3
CLSE 656	Advanced Chemical Reaction Engineering	3
Choose additional CLSE course work at the 500 level or higher		3
Option electives - engineering or science course work		
Select nine credit hours of course work		9
Directed research		
Select six credit hours from the following:		6
CLSE 690	Research Seminar in Chemical and Life Science Engineering	
CLSE 697	Directed Research in Chemical and Life Science Engineering	
Total Hours		30

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Concentration component - CLSE course work		
CLSE 650	Quantitative Analysis in Chemical and Life Science Engineering	3
CLSE 654	Equilibrium Analysis in Chemical and Biological Systems	3
CLSE 655	Nonequilibrium Analysis in Chemical and Life Science Engineering	3
CLSE 656	Advanced Chemical Reaction Engineering	3
Choose additional CLSE course work at the 500 level or higher		6
Option electives - engineering or science course work		
Select 12 hours of course work		12
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Vamsi K. Yadavalli, Ph.D.
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(804) 828-0587

Additional contact
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bfgupton@vcu.edu
(804) 828-4799

Program website: chemical.egr.vcu.edu (http://chemical.egr.vcu.edu)

Engineering, Master of Science (M.S.) with a concentration in electrical and computer engineering

Program mission

The mission of the M.S. in Engineering degree is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge including business and manufacturing aspects; an in-depth research experience at the frontiers of engineering; and skills for lifelong learning and professional development. Graduates of this program will pursue careers in business/industry and government, or will pursue doctoral degrees.

1. Advanced research skills: To produce graduates who possess the necessary advanced analytical, technical and research skills in engineering and the sciences – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers, researchers and professors must be able to interact and share ideas with others in the work environment, and

at a higher level, be capable of creative self-expression, conveying knowledge and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Nov 15	TOEFL or IELTS is required for international students

Note: Students may begin a course of study in either the fall or spring semesters for the engineering programs, although a start in the fall semester is preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the electrical and computer engineering option must have a B.S. degree in electrical engineering, computer engineering or a closely related discipline.

Students in the VCU's electrical engineering B.S. and computer engineering B.S. programs can apply to this M.S. program at the end of their junior year, if they have a minimum major GPA of 3.2 and minimum overall GPA of 3.0. These students are not required to complete the GRE-general exam and should be admitted for a future term to the M.S. program in their last semester of undergraduate study. For admission to the M.S. program, these students must:

1. Fulfill all requirements for the B.S. degree in electrical engineering or computer engineering at VCU
2. Maintain a minimum major GPA of 3.2 and minimum overall GPA of 3.0
3. Complete a minimum of six credits of graduate course work in their senior year. Up to six credits of course work which counted as technical electives toward requirements for the B.S. degree in electrical engineering or computer engineering can be transferred to the M.S. program.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

Thesis option

Students seeking the M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses (including research). Each student must complete 12 credit hours in concentration course work, 12 credit hours in concentration electives course work and six credit hours in thesis research. The student's adviser must review and approve all course work and thesis research credit hours. The total of all credit hours must be at least 30. No elective courses may be used for both M.S. and Ph.D. degrees. At least half of the didactic credit hours required in the student's program must be those designated as exclusively for graduate students, that is, those at the 600 level or above. Students may not present courses receiving grades lower than B for fulfilling degree requirements. More than six credits of C grades or lower in the student's transcript will be considered unsatisfactory performance and may result in termination from the program.

Each student must conduct an original investigation under the supervision of the permanent adviser and prepare a thesis reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. This study is reported in a thesis prepared in acceptable form and style. Upon approval of the thesis by the adviser, the student submits a copy to each member of the advisory committee. The student's advisory committee members examine the thesis and decide upon its acceptability. Each committee member reports to the student's adviser when the thesis is acceptable for defense. The thesis is approved for defense only if accepted unanimously. Upon approval of the thesis, the student appears for a final oral examination administered by the student's advisory committee. This examination of an M.S. candidate includes the subject matter of course work as well as the thesis.

Non-thesis option

Students seeking the non-thesis M.S. degree are required to take a minimum of 30 credit hours of approved graduate courses. Each student must complete 15 credit hours in concentration course work and 15 credit hours in option electives course work.

Each non-thesis student must have a plan of study by the end of the first semester or prior to completing nine credit hours. This plan of study (and all revisions) must be approved by the student's adviser and the assistant dean for graduate affairs of the College of Engineering. The student's adviser must review/approve all course work in advance of enrollment. At least half the didactic credit hours required in the student's program must be designated as 600 level or above. Students may not present courses receiving grades lower than B for fulfilling degree requirements. More than six credits of C grades or lower in the student's transcript will be considered unsatisfactory performance and may result in termination from the program.

Curriculum requirements

Thesis option

Course	Title	Hours
Concentration component		
EGRE course work (EGRE 500 level or higher or courses approved by the advisory committee): This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		12
Option electives		
Engineering or science course work (including EGRE, ENGR, EGRB, EGRM, EGMN, CMSC, CLSE, PHYS, MATH, OPER, STAT, CHEM, 500 level or higher or courses approved by the advisory committee): This component allows the student to take courses in either engineering or science with approval of the student's adviser.		12
Directed research component		
This component emphasizes research directed toward completion of degree requirements under the direction of an adviser and advisory committee.		
EGRE 697	Directed Research in Electrical and Computer Engineering	6
Total Hours		30

The option can be tailored to meet the individual student's academic goals and research interests. Students seeking to take course work and conduct their research in the electrical and computer engineering concentration should contact the graduate program coordinator or department chair of electrical and computer engineering for detailed information about that concentration.

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Concentration component		
EGRE course work (EGRE 500 level or higher or courses approved by the advisory committee): This component allows the student to pursue a series of courses that focus on a specific field of engineering and serve as the student's primary engineering discipline.		15
Option electives		
Engineering or science course work (including EGRE, ENGR, EGRB, EGRM, EGMN, CMSC, CLSE, PHYS, MATH, OPER, STAT, CHEM, 500 level or higher or courses approved by the advisory committee): This component allows the student to take courses in either engineering or science with approval of the student's adviser.		15
Total Hours		30

The option can be tailored to meet the individual student's academic goals and research interests. Students seeking to take course work and conduct their research in the electrical and computer engineering concentration should contact the graduate program coordinator or department chair of electrical and computer engineering for detailed information about that concentration.

Total graduate credit hours required (minimum) 30

Graduate program director
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Program website: electrical-and-computer.egr.vcu.edu/graduate (http://electrical-and-computer.egr.vcu.edu/graduate)

Department of Biomedical Engineering

Henry J. Donahue, Ph.D.
Professor and chair

biomedical.egr.vcu.edu (http://biomedical.egr.vcu.edu)

The Department of Biomedical Engineering offers programs at the baccaluareate, master's and doctoral level.

Biomedical engineering provides in-depth study in a variety of specialization areas including biomedical imaging systems, orthopaedic biomechanics, tissue and cellular engineering, biomaterials, artificial organs, human-computer interfaces, cardiovascular devices, rehabilitation and human factors engineering. The programs allow students to participate in cutting-edge research in one of the nation's most advanced engineering facilities. The department has ongoing collaborations with numerous industries, federal laboratories, the VCU science departments, the university's MCV Campus, the Hunter Holmes McGuire Veterans Affairs Medical Center, the Virginia BioTechnology Research Park and numerous biomedical and clinical programs throughout the VCU Medical Center's MCV Hospitals.

- Biomedical Engineering, Doctor of Philosophy (Ph.D.) (p. 71)
- Biomedical Engineering, Master of Science (M.S.) (p. 73)
- Medicine, Doctor of (M.D.)/Biomedical Engineering, Doctor of Philosophy (Ph.D.) [combined] (p. 74)

Biomedical Engineering, Doctor of Philosophy (Ph.D.)

Program mission

The mission of the Doctor of Philosophy in Biomedical Engineering is to educate biomedical engineering students to be significant contributors in health care and in research and development in biomedicine and bioengineering. The curriculum closely links technical fundamentals in science, engineering and the life sciences, together with the ability to function on multidisciplinary teams, to communicate effectively and to achieve the knowledge tools necessary for lifelong learning.

Program goals

1. Provide students with a graduate education that prepares them for current and future challenges in biomedical engineering
2. Produce graduates who possess the necessary advanced analytical and technical skills in engineering and sciences — responds directly to the higher goals of fulfilling the needs of industry for effective, productive engineers and of providing economic development for the region, state and nation
3. Produce graduates who possess a facility with both written and oral communications — emanates from the requirement that engineers must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression and leadership
4. Produce graduates who demonstrate creativity and innovation in solving technological problems — stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Graduates possess the ability to formulate, analyze and solve problems, analytically and/or experimentally, in the biomedical engineering industry, in the clinical setting or in biomedical research. Graduates can work effectively in teams to solve biomedical and/or clinical problems including the interconnection of engineering and clinical personnel toward the solution of problems of compelling clinical and biomedical interest and need, with particular reference to the biomedical engineering industry, in the clinical setting or in biomedical research. The career paths of BME graduates in these arenas would be enhanced as a result of these skills.

Student learning outcomes

1. Graduates will demonstrate an ability to apply advanced knowledge of mathematics, biomedical sciences and engineering.
2. Graduates will demonstrate an ability to communicate effectively.
3. Graduates will demonstrate an ability to identify, formulate and solve biomedical engineering problems.
4. Graduates will demonstrate an ability to conduct independent research.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Oct 1	International students require TOEFL

Special requirements

- Acceptance of an applicant is based upon the recommendation of the admissions committee with approval of the department chair and the associate dean for graduate studies.

In addition to the general admission requirements of the VCU Graduate School (p. 34), biomedical engineering has the following admission criteria for all entering graduate students:

1. Minimum GPA of 3.0 during the previous 60 credit hours (for applicants with a B.S.)
2. Minimum GRE score of 300 (combined verbal reasoning and quantitative reasoning) including a minimum 150 on the quantitative reasoning
3. Minimum TOEFL score of 101 Internet-based for students whose first or native language is not English

Biomedical engineering will accept a maximum of six credit hours for transfer into either the M.S. or Ph.D. program if the original grades for such courses are B or higher (or equivalent).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements:

The Ph.D. in Biomedical Engineering program is nominally a three-year program. Prior evidence of completion of physiology and/or statistics may result in a waiver of the requirements for these courses as determined by the graduate program director and/or the department chair. These credit hours would be replaced by other graduate-level didactic course work reflective of the field of study. A period of residence of at least three consecutive terms is required. Residency is defined as registration for at least nine credit hours per term. A time limit of eight calendar years, beginning at the time of first registration, is placed on work to be credited toward the Doctor of Philosophy degree.

At the conclusion of the first year of doctoral study (or when the core course requirements have been satisfied), each doctoral student must successfully complete written and oral portions of a comprehensive examination. This examination is designed to test the student on fundamental knowledge in engineering as evidenced by the core (and related elective) courses within the curriculum. Upon completion of this examination, a doctoral student is permitted to initiate a doctoral research project and to complete additional course work consisting of biomedical engineering, clinical and science electives.

Upon completion of all course work and the intended research, a doctoral student must prepare a dissertation describing the completed research. A dissertation defense, under the direction of the advisory committee, will be scheduled to examine the student's research, dissertation documentation and underlying fundamental knowledge needed to complete the research. Upon successful completion of the defense and dissertation, the doctoral student may apply for graduation from Virginia Commonwealth University with the Doctor of Philosophy in Biomedical Engineering.

Curriculum requirements

Course	Title	Hours
Required biomedical engineering courses		
EGRB 507	Biomedical Electronics and Instrumentation	3
EGRB 511	Fundamentals of Biomechanics	3
EGRB 603	Biomedical Signal Processing	3
EGRB 613	Biomaterials	3
Required courses in other departments		
Physiology and statistics (PHIS 501; BIOS or STAT at 500 level or above)		8
Minimum elective courses		
e.g. EGRB, EGRM, ENGR, PHYS, MATH, BIOL, PHIS, BIOC at 500 level or above		15
Research		
EGRB 690	Biomedical Engineering Research Seminar	4
EGRB 697	Directed Research in Biomedical Engineering (required at a level to be determined by each student's graduate advisory committee)	33
Total Hours		72

Total graduate credit hours required (minimum) 72

Graduate program director
Christopher A. Lemmon, Ph.D.
Associate professor, Department of Biomedical Engineering
Email: clemmon@vcu.edu

(804) 827-0446

Additional contact
Henry J. Donahue, Ph.D.
Professor and chair, Department of Biomedical Engineering
Email: hjdonahue@vcu.edu
(804) 828-7956

Program website: biomedical.egr.vcu.edu (http://biomedical.egr.vcu.edu)

Biomedical Engineering, Master of Science (M.S.)

Program mission

The mission of the Master of Science in Biomedical Engineering program is to educate students to be significant contributors in health care and in research and development in biomedicine and bioengineering. The curriculum closely links technical fundamentals in science, engineering and the life sciences, together with the ability to function on multidisciplinary teams, to communicate effectively and to achieve the knowledge tools necessary for lifelong learning.

Program goals

1. Provide students with a graduate education that prepares them for current and future challenges in biomedical engineering
2. Produce graduates who possess the necessary advanced analytical and technical skills in engineering and sciences – responds directly to the higher goals of fulfilling the needs of industry for effective, productive engineers and of providing economic development for the region, state and nation
3. Produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression and leadership
4. Produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Graduates possess the ability to formulate, analyze and solve problems, analytically and/or experimentally, in the biomedical engineering industry, in the clinical setting or in biomedical research. Graduates can work effectively in teams to solve biomedical and/or clinical problems including the interconnection of engineering and clinical personnel toward the solution of problems of compelling clinical and biomedical interest and need, with particular reference to the biomedical engineering industry, in the clinical setting or in biomedical research. The career paths of BME graduates in these arenas would be enhanced as a result of these skills.

Student learning outcomes

1. Graduates will demonstrate an ability to apply advanced knowledge of mathematics, biomedical sciences and engineering.
2. Graduates will demonstrate an ability to communicate effectively.
3. Graduates will demonstrate an ability to identify, formulate and solve biomedical engineering problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1 (Jan 15 for financial assistance)	GRE-General
	Spring	Oct 1	International students require TOEFL

In addition to the general admission requirements of the VCU Graduate School (p. 34), biomedical engineering has the following admission criteria for all entering graduate students:

1. Minimum GPA of 3.0 during the previous 60 credit hours (for applicants with a B.S.)
2. Minimum GRE score of 300 (combined verbal reasoning and quantitative reasoning) including a minimum 148 on the quantitative reasoning
3. Minimum TOEFL score of 101 Internet-based for students whose first or native language is not English

Biomedical engineering will accept a maximum of six credit hours for transfer into the M.S. program if the original grades for such courses are B or higher (or equivalent).

Acceptance of an applicant is based upon the recommendation of the admissions committee with approval of the department chair and the associate dean for graduate studies.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), this program is nominally a two-year program leading to the M.S. in Biomedical Engineering. Prior evidence of completion of physiology may result in a waiver of the requirements for this course as determined by the graduate program director and/or the department chair. These credit hours should be replaced by other graduate-level didactic course work reflective of the field of study. Each Master of Science student must successfully complete a thesis describing his or her individualized research project. At the completion of the research, the student must present the research to the advisory committee and undergo an examination of the research results, thesis documentation and underlying educational foundation necessary to have successfully completed the research. Upon successful completion of the examination and thesis, the student may apply for graduation from Virginia Commonwealth University with the Master of Science in Biomedical Engineering.

Curriculum requirements

Course	Title	Hours
Required biomedical engineering courses		
Select at least three courses from the following:		9
EGRB 507	Biomedical Electronics and Instrumentation	
EGRB 511	Fundamentals of Biomechanics	
EGRB 603	Biomedical Signal Processing	
EGRB 613	Biomaterials	
Required physiology course		
PHIS 501	Mammalian Physiology	5
Minimum elective courses		
e.g. EGRB, EGRM, ENGR, PHYS, MATH, BIOL, PHIS BIOC at 500 level or above [1]		9
Research		
EGRB 690	Biomedical Engineering Research Seminar	1
EGRB 697	Directed Research in Biomedical Engineering [2]	6
Total Hours		30

1

The nine credit hours listed are minimum elective courses required for graduation. However, a student's advisory committee may require additional electives reflective of the field of study.

2

Directed research (EGRB 697) is required at a level to be determined by each student's graduate advisory committee.

Total graduate credit hours required (minimum) 30

Graduate program director
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(804) 827-0446

Additional contact
Henry J. Donahue, Ph.D.
Professor and chair, Department of Biomedical Engineering
Email: hjdonahue@vcu.edu
(804) 828-7956

Program website: biomedical.egr.vcu.edu (http://biomedical.egr.vcu.edu)

Medicine, Doctor of (M.D.)/Biomedical Engineering, Doctor of Philosophy (Ph.D.) [combined]

The M.D./Ph.D. program seeks to train physician-scientists for careers that bridge basic and clinical science. Physician-scientists will translate laboratory discoveries into better patient outcomes. The program begins two months prior to the first year of medical school. These students arrive on campus for orientation and complete two laboratory rotations before the start of medical school classes. They complete the pre-clinical phase of medical school and, after taking the first part of the U.S. National Medical Licensing Examination, enter a Ph.D.-granting department or program as a graduate student. Graduate-level course work, examinations and research will be guided by the dissertation adviser and the dissertation committee, with oversight by members of the M.D./Ph.D. steering committee. The main undertaking at this phase is laboratory research that leads to the Ph.D. dissertation. After completion of doctoral degree requirements, students move to the clinical year of medical school. Students may begin the clinical year of medical school immediately after completion of doctoral degree requirements, regardless of the time in the calendar year, and, 14 to 16 months later, may complete their medical school requirements. These students are exempt from the major part of the fourth year of medical school.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Prospective students submit applications through the American Medical College Application Service. Upon review of the AMCAS documents, qualified applicants are sent supplemental admission materials, including an application for the M.D./Ph.D. program. Those invited to Richmond for interviews will spend one day in the standard interview for the School of Medicine and will spend a second day interviewing with members of the M.D./Ph.D. steering committee, as well as touring labs of faculty scientists.

Admission of medical students to the Ph.D. phase of training takes place formally following completion of the M-II year of M.D. training. A copy of the student file is transferred to the Office of Graduate Education and the individual is formally accepted to Ph.D. training by the VCU Graduate School.

The requirements for a combined professional school/graduate school degree in the School of Medicine are equivalent to those required of students seeking a graduate degree alone and are determined by the individual program.

For additional information, please see the program website at mdphd.vcu.edu (http://www.mdphd.vcu.edu).

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Program website: biomedical.egr.vcu.edu (http://biomedical.egr.vcu.edu)

Department of Chemical and Life Science Engineering

B. Frank Gupton, Ph.D.
Research professor and chair

chemical.egr.vcu.edu (http://chemical.egr.vcu.edu)

Chemical and life science engineering represents the formal interaction of chemical engineering with the life sciences. VCU's Department of Chemical and Life Science Engineering is uniquely poised to bring these two premier disciplines together to form a program distinct in the nation. Programs are offered at the undergraduate and graduate levels.

Life science engineering — with interest areas including stem cell and stem cell-derived tissue engineering, biosciences/biotechnology, cellular engineering, biochips and biosensors, bioinformatics and molecular biocomputing, genetic and protein molecular engineering, environmental life science engineering, and molecular- and cellular-based therapeutics — is the fastest growing of all industries that currently employ engineers.

Chemical engineering and life science engineering share a broad range of common foundational knowledge bases, including the principles of mass and energy balances, transport phenomena and thermodynamics, surface and interfacial science, and reaction science and engineering. Strong academic and research programs in chemical and life science engineering will provide a wealth of exciting professional opportunities for successful graduates of the VCU program.

The bachelor's program offers concentrations in chemical engineering and life science engineering, and a chemical and life science engineering concentration is also available in the Master of Science in Engineering program, as well as the Ph.D. in Engineering program. The CLSE concentrations in the graduate-level programs are designed primarily for students who are interested in applying chemical and engineering principles toward important contemporary topics including process design, metabolic engineering, biosensor and biochip development, high-performance polymers in medicine and energy conversion, polymer surface science, and environmentally benign polymer processing technologies. Major emphasis is placed on chemical and life science engineering fundamentals with additional emphasis on applied chemistry and life sciences.

Department of Computer Science

Krzystof J. Cios, Ph.D.
Professor and chair

computer-science.egr.vcu.edu (http://computer-science.egr.vcu.edu)

The Department of Computer Science offers undergraduate and graduate programs. The Bachelor of Science in Computer Science is a rigorous, highly concentrated curriculum of computer science courses. It includes advanced study in several important areas of computer science and provides a strong foundation in this discipline. Every course is taught by full-time faculty members who also serve as advisers to both undergraduate and graduate students.

The master's degree program emphasizes continuing self-development of individuals currently engaged in science-, technology- and engineering-related fields. It prepares persons who have completed undergraduate majors in these fields for entry into careers in areas that use computing technology. Both the theoretical and applied aspects of computer science are emphasized in this program. The program offers courses in a wide range of areas in computer science, including machine learning, artificial intelligence, cybersecurity and cloud computing, data mining, bioinformatics, and medical informatics.

- Computer and Information Systems Security, Master of Science (M.S.) (p. 81)
- Computer Science, Master of Science (M.S.) (p. 75)
- Computer Science, Master of Science (M.S.), accelerated Bachelor of Science in Computer Science to master's (p. 79)
- Cybersecurity, Certificate in (Post-baccalaureate graduate certificate) (p. 82)
- Data Science, Certificate in (Post-baccalaureate graduate certificate) (p. 84)

Computer Science, Master of Science (M.S.)

Program mission

The program is designed to develop skills and educate CS students to be major contributors in the computing industry. The graduate program in computer science provides state-of-the-art education through the use of didactic courses to those students who wish to further their knowledge and careers within the computing industry. The program

emphasizes continuing self-development and broadening of the knowledge of individuals currently engaged in science, technology and engineering-related fields. It also prepares persons who have completed undergraduate majors in these fields for entry into a career in the numerous areas that use computing technology. Both the theoretical and applied aspects of computer science are emphasized in this program.

Program goals

1. **Advanced software design skills:** To produce graduates who possess the necessary advanced analytical and technical skills in computer science – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers

2. **Advanced problem-solving skills:** To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. **Computer science theory and concepts:** Graduates will demonstrate a solid understanding of the advanced theory and concepts underlying computer science.
2. **System design and implementation:** Graduates will demonstrate the ability, knowledge and technical skills to design and implement a computer-based system, process, component or program.
3. **Applications of computer science in multiple domains:** Graduates will demonstrate the ability to use the knowledge of computer science in order to solve problems in other domains.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements (thesis option only)

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the Graduate study section for additional information on academic regulations for graduate students. (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1	GRE-General
	Spring	Nov 1	TOEFL required for international students

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the M.S. program in computer science must satisfy the requirements outlined below.

Acceptance of an applicant is based upon the recommendation of the graduate committee with approval of the program chair and the associate dean for graduate studies.

Undergraduate education in computer science or in a related discipline or completion of Post-baccalaureate Undergraduate Certificate in Computer Science is highly preferred.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 30 credit hours at the graduate level. Students may not present courses receiving grades less than C for fulfilling degree requirements and can only present up to six credit hours of course work receiving a grade of C. Students may choose either a thesis or non-thesis degree program option. The thesis option is

suggested for students who have a strong research interest or those who wish to pursue a Ph.D.

At most, six non-CMSC credits may be applied toward the degree. Approval of the graduate committee is required before taking the credits.

Up to 30 percent of a student's required non-research graduate-level credits can be transferred into the M.S. program from another college or university. No more than 30 percent of student's required non-research credits in graduate-level courses taken at VCU before admission to the M.S. program may be counted toward the M.S. degree (see bulletin for the accelerated B.S-M.S. in Computer Science program for exception to this rule). The number of credits that may be transferred by students pursuing an M.S. in Computer Science through the Commonwealth Graduate Engineering Program is limited by CGEP policy to 50 percent of the required credits.

All transfer credits must be approved by the graduate committee and the Graduate School using the graduate course transfer form. These credits must not have been applied to any other degree (see bulletin for the accelerated B.S-M.S. in Computer Science program for exception to this rule); however, they may have been taken as part of a post-baccalaureate graduate certificate program.

Students must satisfy breadth requirements by taking two courses from each of the foundational areas. There are three foundational areas for computer science graduate studies: theory, systems and applied computer science.

Curriculum requirements

Non-thesis option [1]

Course	Title	Hours
Theory foundational area		
CMSC 501	Advanced Algorithms	3
Select at least one course from the following:		3
CMSC 510	Regularization Methods for Machine Learning	
CMSC 512	Advanced Social Network Analysis and Security	
CMSC 526	Theory of Programming Languages	
CMSC 591	Topics in Computer Science [2]	
CMSC 601	Convex Optimization	
CMSC 620	Applied Cryptography	
CMSC 621	Theory of Computation	
CMSC 630	Image Analysis	
CMSC 678	Statistical Learning and Fuzzy Logic Algorithms	
CMSC 691	Special Topics in Computer Science [2]	
Systems foundational area		
Select at least two of the following:		6
CMSC 502	Parallel Algorithms	
CMSC 506/ EGRE 526	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 591	Topics in Computer Science [2]	
CMSC 603	High Performance Distributed Systems	
CMSC 605	Advanced Computer Architecture	
CMSC 608	Advanced Database	
CMSC 615	Cryptocurrency and Blockchain Techniques	
CMSC 618	Database and Application Security	
CMSC 622	Network and Operating Systems Security	
CMSC 628	Mobile Networks: Applications, Modeling and Analysis	
CMSC 691	Special Topics in Computer Science [2]	
Applied computer science foundational area		
Select at least two of the following:		6
CMSC 516	Advanced Natural Language Processing	
CMSC 591	Topics in Computer Science [2]	
CMSC 609	Advanced Computational Intelligence	
CMSC 610	Algorithmic Foundations of Bioinformatics	
CMSC 612	Game Theory and Security	
CMSC 623	Cloud Computing	
CMSC 635	Knowledge Discovery and Data Mining	
CMSC 636	Artificial Neural Networks and Deep Learning	
CMSC 691	Special Topics in Computer Science [2]	
Additional course work		
Select 12 additional credit hours of didactic coursework with adviser approval.		12
Total Hours		30

1

Graduate course work only (500 level or higher) may be applied to a graduate degree with at least one half of required course work designated exclusively for graduate students (600 or higher).

2

Only selected sections of CMSC 591 and CMSC 691 count toward individual foundational areas. An up-to-date list of sections of these topics courses, including their assignments to foundational areas, is available at computer-science.egr.vcu.edu/graduate/computer-science (http://computer-science.egr.vcu.edu/graduate/computer-science).

Total graduate credit hours required (minimum) 30

Thesis option [1]

Course	Title	Hours
Theory foundational area		
CMSC 501	Advanced Algorithms	3
Select at least one course from the following:		3
CMSC 510	Regularization Methods for Machine Learning	
CMSC 512	Advanced Social Network Analysis and Security	
CMSC 526	Theory of Programming Languages	
CMSC 591	Topics in Computer Science [2]	
CMSC 601	Convex Optimization	
CMSC 620	Applied Cryptography	
CMSC 621	Theory of Computation	

CMSC 630	Image Analysis	
CMSC 678	Statistical Learning and Fuzzy Logic Algorithms	
CMSC 691	Special Topics in Computer Science [2]	
Systems foundational area		
Select at least two of the following:		6
CMSC 502	Parallel Algorithms	
CMSC 506/ EGRE 526	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 591	Topics in Computer Science [2]	
CMSC 603	High Performance Distributed Systems	
CMSC 605	Advanced Computer Architecture	
CMSC 608	Advanced Database	
CMSC 615	Cryptocurrency and Blockchain Techniques	
CMSC 618	Database and Application Security	
CMSC 622	Network and Operating Systems Security	
CMSC 628	Mobile Networks: Applications, Modeling and Analysis	
CMSC 691	Special Topics in Computer Science [2]	
Applied computer science foundational area		
Select at least two of the following:		6
CMSC 516	Advanced Natural Language Processing	
CMSC 591	Topics in Computer Science [2]	
CMSC 609	Advanced Computational Intelligence	
CMSC 610	Algorithmic Foundations of Bioinformatics	
CMSC 612	Game Theory and Security	
CMSC 623	Cloud Computing	
CMSC 635	Knowledge Discovery and Data Mining	
CMSC 636	Artificial Neural Networks and Deep Learning	
CMSC 691	Special Topics in Computer Science [2]	
Additional course work		
Select three additional credit hours of didactic course work with adviser approval.		3
Research		
CMSC 697	Directed Research [3]	9
Total Hours		30

1

Graduate course work only (500 level or higher) may be applied to a graduate degree with at least one half of required course work designated exclusively for graduate students (600 or higher).

2

Only selected sections of CMSC 591 and CMSC 691 count toward individual foundational areas. An up-to-date list of sections of these topics courses, including their assignments to foundational areas, is available at computer-science.egr.vcu.edu/graduate/computer-science (http://computer-science.egr.vcu.edu/graduate/computer-science).

3

Students seeking to take a research credit course must find a faculty adviser willing to supervise the research.

Total graduate credit hours required (minimum) 30

Degree candidacy requirements (thesis option only)

In order to advance to master's candidacy, the student must:

1. Have completed required course work
2. Have a minimum 3.0 GPA in graduate course work

For fulfilling candidacy requirements:

1. Students may not present courses receiving grades less than C or not conforming to Graduate School graduation requirements. No more than six credit hours with a grade of C may be presented.
2. Students must be in compliance with candidacy requirements of VCU Graduate School (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy) and be in compliance with the time to degree, which is six years for a master's degree.
3. The student will produce a written thesis in the format specified by the VCU Graduate School and will publicly defend the thesis before a committee consisting of the thesis adviser, at least one other faculty member from the computer science program and a faculty member from outside of the computer science program.

Typical plan of study

Students should choose thesis or non-thesis option during their first semester of study. The non-thesis option is the default.

The typical plan of study for non-thesis option students involves doing between nine and 15 credit hours per semester and fulfilling the requirements of the program typically in three semesters.

A plan of study for thesis option students should be designed with the research adviser of the student to take into account the direction of thesis research.

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Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Computer Science, Master of Science (M.S.), accelerated Bachelor of Science in Computer Science to master's

Students accepted into this selective program accomplish both the B.S. and M.S. degrees within five years by taking additional graduate courses within the first four years of the program. Up to two of these courses will count as open electives in the B.S. program and as didactic course work in the M.S. program.

Program mission

The program is designed to develop skills and educate CS students to be major contributors in the computing industry. The graduate program in computer science provides state-of-the-art education through the use of didactic courses to those students who wish to further their knowledge and careers within the computing industry. The program emphasizes continuing self-development and broadening of the knowledge of individuals currently engaged in science, technology and engineering-related fields. It also prepares persons who have completed undergraduate majors in these fields for entry into a career in the numerous areas that use computing technology. Both the theoretical and applied aspects of computer science are emphasized in this program.

Program goals

1. **Advanced software design skills:** To produce graduates who possess the necessary advanced analytical and technical skills in computer science – responds directly to the higher goal of fulfilling the needs of industry, academe and research laboratories for effective, productive engineers, professors and researchers
2. **Advanced problem-solving skills:** To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. **Computer science theory and concepts:** Graduates will demonstrate a solid understanding of the advanced theory and concepts underlying computer science.
2. **System design and implementation:** Graduates will demonstrate the ability, knowledge and technical skills to design and implement a computer-based system, process, component or program.
3. **Applications of computer science in multiple domains:** Graduates will demonstrate the ability to use the knowledge of computer science in order to solve problems in other domains.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1 (Feb 15 for financial assistance)	GPA (see below)
	Spring	Nov 1	TOEFL required for international students

Students are selected from those already enrolled in B.S. in Computer Science program at VCU.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

In order to be accepted students must:

1. Apply to the computer science graduate committee during the first semester after they have completed the last of the following sequence of classes:

Course	Title	Hours
CMSC 255	Introduction to Programming	4
CMSC 256	Data Structures and Object Oriented Programming	4
CMSC 257	Computer Systems	4
CMSC 302	Introduction to Discrete Structures	3
CMSC 303	Introduction to the Theory of Computation	3
CMSC 311	Computer Organization	3

   Transfer students who enter with all of these courses (or equivalents) must apply during their first semester at VCU.

2. Have a minimum GPA of 3.4 based on CMSC 255, CMSC 256, CMSC 257, CMSC 302, CMSC 303 and CMSC 311; all grades in any repeated courses will be included in computing this GPA. Students transferring these courses into the program will have the grades from their previous institution included in computing this GPA only for purposes of determining eligibility for this program.

3. Have a minimum overall GPA of 3.0.

In the last semester before graduating with the B.S. degree, the student will formally apply to the master's program. Providing the student has maintained a minimum GPA of 3.2 in the major, acceptance to the M.S. program is guaranteed. Accepted students are not required to complete the GRE for admission to the M.S. portion of the program.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 30 credit hours at the graduate level to graduate with the M.S. degree. Students must also complete the requirements for the B.S. degree in Computer Science.

Students accepted into this selective program accomplish both the B.S. and M.S. degrees within five years by taking additional graduate courses within the first four years of the program. Up to six credit hours will count as open electives in the B.S. program and as didactic course work in the M.S. program.

A student may choose either a thesis or non-thesis M.S. degree program. The thesis option is suggested for students who have a strong research interest or those who wish to pursue a Ph.D.

Curriculum requirements

Students accepted into the B.S.-M.S. program are allowed to transfer up to 12 graduate-level credits into the M.S. program, including up to six credit hours that were counted as open electives toward requirements for the B.S. degree.

After meeting all requirements for the B.S. degree, students in the program are eligible to take 600-level courses.

Apart from the exceptions above, all regulations outlined in the B.S. in Computer Science and M.S. in Computer Science bulletins apply toward the respective degrees.

Typical program of study

Before graduating with the B.S. degree, students in the program are expected to:

- Take six graduate-level didactic credits that will count as open electives toward their B.S. degree (that is, toward the requirements on total number of credits, upper-level credits and toward graduation GPA, but not as the required three CMSC technical electives) and as didactic credits toward their M.S. degree.
- Take an additional six graduate-level didactic credit hours that will count toward their M.S. degree but not toward the B.S. degree. In particular, these cannot be used to satisfy the total and upper-level credit requirements in the B.S. degree nor in calculating the B.S. graduation GPA.

Students cannot count more than six credit hours of non-CMSC courses toward the M.S. degree. Any non-CMSC graduate credits require approval of the graduate committee.

The typical full program of study in the accelerated B.S.-M.S. program is as follows:

Years 1-3

- Regular undergraduate program course work

Year 3

- Application to the accelerated B.S.-M.S. program

Year 4

- Remaining regular undergraduate program course work
- Six credit hours of CMSC 500-level courses, counted toward B.S. and M.S.
- Six credit hours of CMSC 500-level courses, counted toward M.S. only
- Application to the M.S. program

Year 5

Regular graduate program course work: 18 credits of CMCS 500-level and 600-level courses, counted toward M.S. only

Students must complete at least 50 percent of their graduate-level didactic credits at the 600-level for the M.S. degree; additional restrictions apply based on thesis and non-thesis study options asspecified in the M.S. in Computer Science bulletin.

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Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Computer and Information Systems Security, Master of Science (M.S.) [College of Engineering]

Program mission

The Master of Science in Computer and Information Systems Security provides for the scholarly and professional needs of several groups who have either accepted or are keen to take on the challenge of protecting information resources of firms and society at large.

Program goal

Graduates of this program are expected to take on leadership positions, including as chief security officer, in computer and information systems security in organizations. VCU's program takes a broad interdisciplinary approach to computer and information systems security that will help develop the student's ability to see the larger organizational, social, political, ethical and economic aspects of information security.

Student learning outcomes

Graduates of the program will be:

1. Prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations
2. Familiar with state-of-the-art security technologies and best practices

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE or GMAT
	Spring	Nov 1	TOEFL for international students

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

The Master of Science in Computer and Information Systems Security, jointly offered by the Department of Computer Science in the College of Engineering and the Department of Information Systems in the School of Business, is designed primarily for students interested in professional roles in business, industry or government. Program graduates will serve as leaders within the computer and information systems security community and as strategic partners within the enterprises in which they work. They will stay attuned to, and anticipate changes in, the computer and information systems security environment and ensure that security solutions create a sound, competitive, cost-effective advantage for the enterprise.

Graduates of the program will be prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations and will be familiar with state-of-the-art security technologies and best practices. The program takes a broad interdisciplinary approach to computer and information systems security that will help students develop the ability to see the larger organization and social, political, ethical and economic aspects of information security, as well as offering a unique graduate-level curriculum that is both technically and managerially oriented.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.S. in Computer and Information Systems Security requires 30 graduate credit hours, including a core curricular component and an elective component. The elective component consists of three courses chosen by the student and selected from CISS course offerings or, with the approval of the program co-directors, from courses offered by the departments of Computer Science, Information Systems, Criminal Justice and Forensic Science.

Curriculum requirements

Students with an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems should be adequately prepared for the graduate curriculum. Students from other academic backgrounds may need to complete undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

Prerequisite courses

Course	Title	Hours
CMSC 312	Introduction to Operating Systems	3
or INFO 361	Systems Analysis and Design	
CMSC 355	Software Engineering: Specification and Design	3
or INFO 370	Fundamentals of Data Communications	
CMSC 401	Algorithm Analysis with Advanced Data Structures	3
CMSC 508	Database Theory	3
or INFO 364	Database Systems	
MATH 211	Mathematical Structures	3
or CMSC 302	Introduction to Discrete Structures	
STAT 212	Concepts of Statistics	3

Curriculum

Course	Title	Hours
Core component		
CISS/CMSC 618	Database and Application Security	3
CISS/CMSC 622	Network and Operating Systems Security	3
CISS 624/CMSC 620	Applied Cryptography	3
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	3
CISS/INFO 644	Principles of Computer and Information Systems Security	3
INFO 646	Security Policy Formulation and Implementation	3
Elective component		
Choose four of the following courses. Students must select a minimum of one CMSC and one INFO course		12
CMSC 502	Parallel Algorithms	
CMSC 506	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 612	Game Theory and Security	
CMSC 691	Special Topics in Computer Science	
INFO 609	Data-centric Re-engineering Analysis/ Planning	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 691	Topics in Information Systems	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
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Program websites: computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security (http://computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security) and business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security (http://business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security)

Cybersecurity, Certificate in (Post-baccalaureate graduate certificate)

The Certificate in Cybersecurity will train students to analyze and respond to threats against the security of computer systems. Students who complete the certificate will be able to assist software developers and system administrators by analyzing the security of databases, applications, networks and computer systems; assessing security risks and identifying vulnerabilities in computer and network systems; and developing methods and techniques for defending against a range of types of cyber attacks. The program will prepare graduates for entry into jobs as specialists in cyber defense for industry and the public sector.

Student learning outcomes

1. **Cybersecurity foundations:** Graduates will demonstrate a solid understanding of the foundational concepts underlying cybersecurity.
2. **Cybersecurity specialization:** Graduates will demonstrate the ability, knowledge and technical skills to assess and mitigate specific types of cybersecurity risk.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall (preferred)	Jun 1	TOEFL required for all international students
	Spring	Nov 1	

Admission criteria

The admission requirements outlined below apply to all students. All applicants to post-baccalaureate certificate programs are required to submit the online application form to VCU Undergraduate Admissions.

The Department of Computer Science also requires the following additional materials:

- Official undergraduate transcripts from all schools attended
- A resume stating relevant work experience
- A statement of purpose outlining career goals
- Three letters of recommendation – professional and/or academic

To be considered for admission to the certificate program, all candidates must satisfy the following requirements:

- Applicants must already have a bachelor's degree. A bachelor's degree in computer science or in a closely related discipline is highly preferred.
- Applicants must present an undergraduate minimum GPA of 3.0 and have completed at least one semester of calculus and one semester of discrete mathematics (VCU MATH 211 or equivalent), both with minimum grades of B.

Non-native English speakers will provide evidence of proficiency in English by one of the following methods:

- A Test of English as a Foreign Language minimum composite score of 100 for the Internet-based test or score of 600 for the paper-based test

  or

- An International English Language Testing System minimum score of 6.5 on the academic exam

Acceptance of an applicant is based upon the recommendation of the computer science graduate committee with approval of its director and the associate dean for graduate studies.

Students may transfer up to three credits from outside of the program to fulfil the program requirements. The transfer must be approved by the computer science graduate committee.

Degree requirements

All students must take four courses in total, including one course from the list of three restricted undergraduate electives, one course from the list of three restricted graduate electives and two other courses from the list of open electives.

Curriculum requirements

Course	Title	Hours
Restricted undergraduate elective (choose one)		3
CMSC 413	Introduction to Cybersecurity	
CMSC 414	Computer and Network Security	
CMSC 415	Introduction to Cryptography	
Restricted graduate elective (choose one)		3
CMSC 615	Cryptocurrency and Blockchain Techniques	
CMSC 618	Database and Application Security	
CMSC 622	Network and Operating Systems Security	
Open electives (choose two)		6
CMSC 512	Advanced Social Network Analysis and Security	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 612	Game Theory and Security	
CMSC 615	Cryptocurrency and Blockchain Techniques [1]	
CMSC 618	Database and Application Security [1]	
CMSC 620	Applied Cryptography	
CMSC 622	Network and Operating Systems Security [1]	
CMSC 628	Mobile Networks: Applications, Modeling and Analysis	
Total Hours		12

[1]Course may be used as an open elective if not taken as a restricted elective.

Total credit hours required (minimum) 12

Graduate program director
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Additional contact
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Professor and chair, Department of Computer Science
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(804) 828-9671

Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Data Science, Certificate in (Post-baccalaureate graduate certificate)

The Certificate in Data Science will train students in computer methods for analyzing big datasets generated by industry, research and government entities. Students will learn techniques for transforming the data into knowledge; developing algorithms for constructing computer systems that automatically learn from data; and tracking and evaluating new techniques and approaches in data science. The program will prepare graduates for entry into jobs as specialists in data science for industry and the public sector.

Student learning outcomes

1. **Data science foundations:** Graduates will demonstrate a solid understanding of the foundational concepts underlying data science.
2. **Data science specialization:** Graduates will demonstrate the ability, knowledge and technical skills to process and analyze data in order to extract new insights.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall (preferred)	Jun 1	TOEFL required for all international students
	Spring	Nov 1	

Admission criteria

The admission requirements outlined below apply to all students. All applicants to post-baccalaureate certificate programs are required to submit the online application form to VCU Undergraduate Admissions.

The Department of Computer Science also requires the following additional materials:

- Official undergraduate transcripts from all schools attended
- A resume stating relevant work experience
- A statement of purpose outlining career goals
- Three letters of recommendation – professional and/or academic

To be considered for admission to the certificate program, all candidates must satisfy the following requirements:

- Applicants must already have a bachelor's degree. A bachelor's degree in computer science or in a closely related discipline is highly preferred.
- Applicants will be considered on a case-by-case basis, however, candidates should present an undergraduate minimum GPA of 3.0 and have completed at least one semester of calculus and one semester of discrete mathematics (VCU MATH 211 or equivalent), both with minimum grades of B.

Non-native English speakers will provide evidence of proficiency in English by one of the following methods:

- A Test of English as a Foreign Language minimum composite score of 100 for the Internet-based test or score of 600 for the paper-based test

  or

- An International English Language Testing System minimum score of 6.5 on the academic exam

Acceptance of an applicant is based upon the recommendation of the computer science graduate committee with approval of its director and the associate dean for graduate studies.

Students may transfer up to three credits from outside of the program to fulfil the program requirements. The transfer must be approved by the computer science graduate committee.

Degree requirements

The focus of the curriculum is centered on the two required courses, CMSC 435 and CMSC 635, which together provide the foundation for more advanced graduate-level elective courses. The main strength of the curriculum is the combination of deep knowledge in machine learning methods and tools provided by the required courses, with the breadth of data-oriented training opportunities provided by the electives, allowing the students to tailor their plan of study toward their professional interests.

Course	Title	Hours
Required courses		
CMSC 435	Introduction to Data Science	3
CMSC 635	Knowledge Discovery and Data Mining	3
Restricted elective (choose one)		3
CMSC 516	Advanced Natural Language Processing	
CMSC 603	High Performance Distributed Systems	
CMSC 630	Image Analysis	
Open elective (choose one)		3
CMSC 510	Regularization Methods for Machine Learning	
CMSC 516	Advanced Natural Language Processing [1]	
CMSC 601	Convex Optimization	
CMSC 603	High Performance Distributed Systems [1]	
CMSC 630	Image Analysis [1]	
CMSC 636	Artificial Neural Networks and Deep Learning	
CMSC 678	Statistical Learning and Fuzzy Logic Algorithms	
Total Hours		12

[1]Course may be used as an open elective if not taken as a restricted elective.

Total credit hours required (minimum) 12

Graduate program director
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Additional contact
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Professor and chair, Department of Computer Science
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(804) 828-9671

Program website: computer-science.egr.vcu.edu/graduate (http://computer-science.egr.vcu.edu/graduate)

Department of Electrical and Computer Engineering

Erdem Topsakal, Ph.D.
Professor and chair

electrical-and-computer.egr.vcu.edu (http://electrical-and-computer.egr.vcu.edu)

The Department of Electrical and Computer Engineering prepares students for highly competitive, national placement in electrical and computer engineering employment and graduate education by providing

a thorough grounding in electrical science and design, together with a sound foundation in mathematics, basic sciences and life skills.

The department offers baccalaureate degrees in computer engineering and electrical engineering, in addition to minors in both areas, as well as the option to choose course work appropriate for a pre-medicine or pre-dentistry curriculum. An electrical and computer engineering track is available in the Master of Science in Engineering as well as the Ph.D. in Engineering. The track is designed to prepare students for practice, research and/or teaching of electrical and computer engineering at the advanced level by providing intensive preparation for professional practice in the microelectronics, nanoelectronics, computer engineering, and controls and communications aspects of electrical and computer engineering. At the advanced level, this track prepares individuals to perform original, leading-edge research in the broad areas of microelectronics, nanoelectronics, controls and communications, and computer engineering.

The curricula of the department provide a strong foundation in the fundamentals of the profession, including engineering problem-solving, breadth in the major facets of the profession and the opportunity to specialize in today's critical areas of computer engineering, communication systems and microelectronics. Graduates will be well prepared for constant technological change and growth through lifelong learning.

Department of Mechanical and Nuclear Engineering

Gary Tepper, Ph.D.
Professor and chair

mechanical-and-nuclear.egr.vcu.edu (http://mechanical-and-nuclear.egr.vcu.edu)

Mechanical engineering is one of the oldest and broadest engineering disciplines. Mechanical engineers design and analyze machines of all types including automobiles, airplanes, rockets, submarines, power generation systems, biomedical instrumentation, robots, manufacturing systems, household appliances and many, many more. In addition to well-known areas such as nuclear energy, nuclear propulsion and nuclear medicine, nuclear engineers are involved in many other applications of nuclear science and technology in fields as diverse as agriculture, industry, homeland security, forensics, environmental protection and even art. The Department of Mechanical and Nuclear Engineering provides quality graduate and undergraduate education through the following degree-granting programs:

- B.S. in Mechanical Engineering (general mechanical engineering curriculum)
- B.S. in Mechanical Engineering (nuclear engineering concentration)
- M.S. in Mechanical and Nuclear Engineering (thesis and non-thesis options)
- Ph.D. in Mechanical and Nuclear Engineering

Current areas of research within the department include but are not limited to energy conversion systems, smart materials, corrosion, medical devices, aerosol science, sensors, radiation detection and measurement, nuclear reactor design, robotics, fluid mechanics, nanotechnology, and biomechanics.

- Mechanical and Nuclear Engineering, Doctor of Philosophy (Ph.D.) (p. 86)
- Mechanical and Nuclear Engineering, Master of Science (M.S.) (p. 90)

Mechanical and Nuclear Engineering, Doctor of Philosophy (Ph.D.)

Program mission

The Ph.D. curriculum will provide graduate-level training in both mechanical and nuclear engineering. Graduates of the program will be prepared for research and teaching careers in areas such as energy production, nuclear waste transport, storage and disposal, and the development of new mechanical devices for use in nuclear medicine. Technical electives in both mechanical and nuclear engineering will allow students to pursue in-depth study relevant to their selected research topics. Dissertation topics pursued as directed research credit hours will be devoted to open-ended research projects at the intersection of mechanical and nuclear engineering.

1. Advanced technical skills: To produce graduates who possess the necessary advanced analytical and technical skills in engineering and sciences – responds directly to the higher goals of fulfilling the needs of industry for effective, productive engineers and of providing economic development for the region, state and nation
2. Communication: To produce graduates who possess a facility with both written and oral communications – emanates from the requirement that engineers must be able to interact and share ideas with others in the work environment, and at a higher level, be capable of creative self-expression and leadership
3. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Communicate effectively: Graduates will demonstrate an ability to communicate effectively.
3. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 15	GRE-General
	Spring	Oct 1	TOEFL required for international students

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following comprise the admissions requirements for the mechanical and nuclear engineering Ph.D. program:

1. Proof of graduation from an accredited college or university with either a bachelor's or a master's degree in mechanical engineering, nuclear engineering or a related discipline with a minimum grade point average of 3.0
2. Demonstration of proficiency in spoken and written English
3. Submission of results of the Graduate Record Examination (minimum score for admission to be established annually by the MNE graduate committee)
4. Submission of at least three letters of recommendation from former instructors or other individuals qualified to evaluate the applicant's ability to engage in graduate study in mechanical and nuclear engineering
5. Submission of a written statement of purpose that clearly demonstrates commitment to a career in mechanical and nuclear engineering

The MNE graduate committee may admit students unconditionally or provisionally. Provisional admission may be granted when deficiencies are identified; these deficiencies should be remedied by the time specified by the admissions committee. At the end of the provisional period, the student's progress is evaluated. Failure to meet the goals set forth by the MNE graduate committee at the time of admission results in a show-cause notice. A response to this notice that is deemed unsatisfactory results in a recommendation for dismissal. The student has the right to appeal the recommendation for dismissal following procedures set forth by the College of Engineering and the VCU Graduate School. Remedial courses, or those designed to remove deficiencies, will not be accepted for credit hours toward the fulfillment of the course requirements for the Ph.D.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the Ph.D. degree will require a minimum of 68 credit hours beyond the B.S. degree or a minimum of 36 credit hours beyond the M.S. degree. Students may enter the Ph.D. program with either a B.S. or M.S. degree.

Transfer policy

Transfer courses must be approved by the MNE graduate committee and must fulfill all requirements of the VCU Graduate School as described in the student handbook. For students entering with a B.S. degree, a maximum of nine credit hours of technical electives may be transferred from another VCU program or outside institution and, if not applied previously toward another degree, may be applied toward the Ph.D.

Doctoral comprehensive oral examination guidelines

Goals

A comprehensive oral examination is used to determine admission of graduate students to Ph.D. candidacy in the Department of Mechanical and Nuclear Engineering. The CO exam is administered by the graduate examination committee (a standing committee of four MNE faculty members with rotating one year terms selected by the graduate program committee) with the goals of:

1. Assessing the student's understanding of MNE foundational material at the Ph.D. level
2. Evaluating the student's critical-thinking and problem-solving skills
3. Determining the student's ability to communicate ideas clearly and effectively

Format
The CO will be administered by the graduate examination committee, which is organized by the MNE graduate program committee as outlined in the graduate student handbook. The format of the CO is as follows:

- The student provides a brief presentation (~five slides). The student should provide a copy of his or her presentation to the committee at least one week prior to the CO exam detailing:
  - His or her academic background
  - Courses taken in graduate school at VCU (including a printed copy of the VCU transcript made available to committee members)
  - The remaining planned course of study
- The student then provides a brief presentation (~two to three slides) describing:
  - The expected dissertation research area
  - The proposed methods for addressing the research topic
- The GEC then presents questions in an oral format to the student.
- The question-and-answer session of the CO should not exceed 1 hour.
- After the question-and-answer component of the CO, the GEC meets in closed session to discuss their assessment of the candidate's responses and vote on admission to Ph.D. candidacy.

Assessment
The purpose of the CO is to assess items 1-3 provided under "Goals" in order to determine if the student should be admitted to Ph.D. candidacy. The committee will discuss the responses, including strengths and weaknesses observed. Correct answers are not required for a certain percentage of questions. Instead, the committee is to deliberate on the potential of the candidate to successfully complete the Ph.D. degree and become a successful professional. The committee then grades the student as pass or fail in each area of the goals. The committee also votes "yes" or "no" on admission to Ph.D. candidacy. A majority vote for promotion to candidacy is required for successful completion of the CO. At least three (of the four GEC) voting committee members must be present in the CO exam and vote.

Preparation
To prepare for the CO exam, the student should review course work completed in the first year of graduate study as a Ph.D. student and foundational MNE undergraduate courses.

Scheduling
It is anticipated that the student will have completed two full semesters of courses in graduate school at VCU at the time of the CO exam and have a firm understanding of undergraduate concepts. The student must pass the CO before the end of their fourth semester (excluding summer sessions) as a Ph.D. student at VCU. The primary CO will be administered during the second week of the fall semester. The graduate coordinator will provide a sign-up list of available times to graduate students. A secondary CO will be offered in the second week of the spring semester of each year for students who started in the spring semester of the previous year and for second chance exams.

Successful completion of the CO
Upon successful completion of the CO, the student works with his or her adviser to develop the dissertation proposal document for presentation to the committee at the proposal presentation. The proposal presentation will focus on the research topic an emphasis on objectives (or hypotheses) and a discussion of completed and future work.

Unsuccessful CO
In the event of an unsuccessful CO, the student may retake the exam once. The adviser is expected to work with the student on weaknesses identified by the committee. The CO is then re-administered and must be completed successfully within the first four semesters as a Ph.D. student at VCU. Failure to successfully complete the CO within the first four semesters is grounds for dismissal from the program. Special circumstances in scheduling within the four-semester timeline can be accommodated with written approval from the MNE graduate program director and approval from the student's primary adviser.

Benefits of the CO format
The CO is intended to benefit the student, primary adviser and department by:

- Providing feedback to the student at an early stage regarding admission to Ph.D. candidacy
- Critically evaluate Ph.D. candidates by committee consensus at an early stage
- Continue the development of well-trained successful Ph.D. applicants and professionals

For more information, contact the graduate program director.

Research adviser and graduate dissertation committee

Students will be expected to select a research adviser and dissertation committee within 12 months of enrollment in the Ph.D. program. The dissertation committee will consist of five faculty members, including the primary research adviser and at least two other faculty members from the mechanical and nuclear engineering graduate program. This committee reviews and votes to approve or disapprove the student's dissertation research proposal, oral candidacy exam, and the final Ph.D. dissertation and oral defense. This committee also makes the final recommendation to award the Ph.D. degree. All voting members of the committee must be members of the graduate faculty. Additional, nonvoting members may serve on the committee with the approval of the MNE graduate program director.

Proposal presentation exam

Within nine months after passing the qualifying examination the student will submit one copy of an original dissertation research proposal based upon their proposed research project to each member of his or her dissertation committee. The proposal consists of the research topic and proposed research plan. The proposal should include a thorough literature review of the topic and contain information sufficient to judge the feasibility, scope and potential impact of the research. The dissertation committee will then administer an exam based on the material submitted in the dissertation research proposal. The format of the exam is an oral presentation by the candidate with questions by the dissertation committee members. A favorable decision by the dissertation committee with no more than one negative vote (all members are required to vote) shall be required to pass the exam. If a student fails the exam, one re-examination may be given with the consent of the dissertation committee. Failure to pass the second exam will result in dismissal from the program.

Publication requirement

A Ph.D. student appearing for the final defense in the Department of Mechanical and Nuclear Engineering must provide evidence of a minimum of two manuscripts accepted for publication in peer-reviewed archival journals recognized by the ISI Web of Science at the time of defense. These publications should be based on the student's

dissertation research and must also be acceptable to the student's dissertation committee. The student is expected to have served as the first author in one or more of the papers. Specific publication requirements are available on the department's website as well as in the College of Engineering graduate handbook.

Dissertation defense

No earlier than six months after passing the oral candidacy examination, the student will defend the dissertation in an open forum administered by the dissertation committee. At least two weeks prior to the defense, the candidate will submit a written copy of the dissertation to each committee member and schedule a date for the defense. The defense will be advertised and faculty and student colleagues will be invited to attend. During the defense, the student will present a detailed summary of their research project, which should be the original problem presented and approved during the proposal presentation exam. If a solution of the original problem proves elusive for reasons beyond the student's control, the student may be allowed to redirect the research with permission from the dissertation committee and find an alternate pathway to the solution of a redefined problem. The format of the dissertation defense will be a presentation by the student followed by questions from the dissertation committee and other attendees. After the first round of questions are completed, the non-committee members in attendance will be asked to leave and the dissertation committee members will hold a second round of questions in closed session. After the second round of questions is completed the student will be asked to leave and the committee members will deliberate privately. The problem presented and solved must be of sufficient importance and interest to warrant publication in a peer reviewed journal in the student's area of specialization. A favorable decision by the dissertation committee with no more than one negative vote (all members are required to vote) shall be required to pass the dissertation defense. If a student fails the dissertation defense, one re-examination may be given. Failure to pass the second dissertation defense will result in dismissal from the program.

Students entering with a B.S. degree who are terminated from the Ph.D. program because of a failure to pass the QE, proposal presentation exam or dissertation defense (but not for other reasons such as academic dishonesty) will have the option to continue toward the M.S. in Mechanical and Nuclear Engineering.

Time limit

It is anticipated that students entering with a B.S. will complete the program in four years from the time the student passes the qualifying examination. Students must be continuously enrolled in the program (minimum of one credit hour per semester). All requirements for the Ph.D. degree must be completed within six years of passing the qualifying examination.

It is anticipated that students entering with an M.S. degree will complete the program in three years from the time the student passes the qualifying examination. Students must be continuously enrolled in the program (minimum of 1 credit hour per semester). All requirements for the Ph.D. must be completed within five years of passing the qualifying examination.

Any student may request a one-year extension of the maximum time for extenuating circumstances such as a medical situation. The graduate program committee will review and approve or deny all such requests. The maximum time cannot be extended longer than one year. Students who do not satisfy the degree requirements within the maximum time will be dismissed from the program.

Because of the maximum time limits imposed on students in the Ph.D. program, the program does not accept part-time students.

Preparing Future Faculty Program

Students enrolled in the program will have the option and are strongly encouraged to participate in the Preparing Future Faculty Program. The VCU Graduate School provides graduate students with ongoing opportunities for academic and professional development. The PFFP at VCU offers a series of short courses and professional development opportunities for graduate students interested in pursuing careers in higher education. The series is modeled on the national PFFP created by the Association of American Colleges and Universities. PFFP courses introduce graduate students to the roles and responsibilities of higher education; address teaching, learning and technology issues in the college classroom; and incorporate material on the academic job search and continued professional development. For those students who complete all course requirements, the capstone course is an internship/externship experience during which the student is mentored by a senior faculty member. The program offers access to resources and activities and service-learning experiences while providing networking opportunities with students and faculty from a wide range of disciplines as well as discipline-specific areas of study. Since most courses are one or two credit hours, students are able to add them easily into their academic program schedules.

Curriculum requirements

Requirements for students entering with a B.S. degree

Course	Title	Hours
Core courses		
EGMN 604	Mechanical and Nuclear Engineering Materials	3
EGMN 605	Mechanical and Nuclear Engineering Analysis	3
EGMN 606	Mechanical and Nuclear Engineering Continuum Mechanics	3
EGMN 607	Heat and Mass Transfer Theory and Applications	3
EGMN 610	Topics in Nuclear Engineering	3
Technical elective component		
With the approval of your adviser or program director, select 21 credit hours of courses with the following rubrics: EGMN, EGRM, ENGR, EGRN, EGRB, EGRE, CLSE, CMSC, PHYS, MATH, NANO, CHEM, BIOL, GRAD, LFSC, OVPR.		21
Directed research component		
This component consists of dissertation research directed toward completion of Ph.D. degree requirements under the direction of a dissertation adviser and dissertation committee. Students can register for 1 to 15 credit hours of directed research in mechanical and nuclear engineering.		24
EGMN 697	Directed Research in Mechanical and Nuclear Engineering	
Seminar component		

EGMN 690	Mechanical and Nuclear Engineering Seminar	8
Total Hours		68

Notes:

1. A total of 21 credit hours from the core courses, technical electives or seminar (not including directed research credit hours) must be at the 600 level or higher.
2. In certain cases, independent study courses (EGMN 691) are offered by individual faculty members. Up to three credit hours of EGMN 691 may be taken as a technical elective course.
3. EGMN 610 is not required for students entering with a B.S. in Nuclear Engineering. A replacement course approved by the MNE graduate program director must be taken and will count toward the required 15 credits of core courses.

Total graduate credit hours required (minimum) 68

Requirements for students entering with an M.S. degree

Course	Title	Hours
Core courses		
EGMN 604	Mechanical and Nuclear Engineering Materials [1]	3
EGMN 607	Heat and Mass Transfer Theory and Applications	3
EGMN 610	Topics in Nuclear Engineering	3
Directed research component		
This component consists of dissertation research directed toward completion of Ph.D. degree requirements under the direction of a dissertation adviser and dissertation committee.		24
EGMN 697	Directed Research in Mechanical and Nuclear Engineering	
Seminar component		
EGMN 690	Mechanical and Nuclear Engineering Seminar	3
Total Hours		36

Notes:

1. A total of nine credit hours of core courses and seminar but not including directed research credit hours must be at the 600 level or higher.
2. Students entering with an M.S. will follow the same curriculum as the students entering with a B.S. with the above noted reduction in required credit hours.
3. EGMN 610 is not required for students entering with a B.S. in Nuclear Engineering. A replacement course approved by the MNE graduate program director must be taken and will count toward the required 9 credits of core courses.

Total graduate credit hours required (minimum) 36

Graduate program director
Karla M. Mossi, Ph.D.
Associate professor
kmmossi@vcu.edu
(804) 827-5275

Additional contact
Gary C. Tepper, Ph.D.
Professor and chair, Department of Mechanical and Nuclear Engineering
gctepper@vcu.edu
(804) 827-4079

Program website: mechanical-and-nuclear.egr.vcu.edu/academics/graduate (http://mechanical-and-nuclear.egr.vcu.edu/academics/graduate)

Mechanical and Nuclear Engineering, Master of Science (M.S.)

Program mission

The mission of the M.S. in Mechanical and Nuclear Engineering degree is to provide graduate students with learning opportunities for acquiring a broad foundation of engineering knowledge including business and manufacturing aspects; an in-depth research experience at the frontiers of engineering; and skills for lifelong learning and professional development. Graduates of this program will pursue careers in business/industry and government, or will pursue doctoral degrees.

1. Advanced technical skills: To produce graduates who possess the necessary advanced analytical and technical skills in engineering and sciences – responds directly to the higher goals of fulfilling the needs of industry for effective, productive engineers and of providing economic development for the region, state and nation
2. Advanced problem-solving: To produce graduates who demonstrate creativity and innovation in solving technological problems – stems from the realization that new knowledge and new solutions to existing problems are necessary to meet the needs of our changing society and to advance the quality of human life

Student learning outcomes

1. Apply advanced knowledge of mathematics, science or engineering: Graduates will demonstrate an ability to apply advanced knowledge of mathematics, science or engineering.
2. Identify, formulate and solve engineering problems: Graduates will demonstrate an ability to identify, formulate and solve engineering problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student handbook (http://www.egr.vcu.edu/current-students/graduate-student-services/resources-forms) is available on the College of Engineering website.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Mechanical and Nuclear Engineering, Master of Science (M.S.)

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jan 15	GRE-General
	Spring	Oct 1	TOEFL required for international students

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Engineering, applicants to the mechanical and nuclear engineering degree must have a B.S. degree in mechanical engineering, nuclear engineering or a closely related discipline.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

The Master of Science in Mechanical and Nuclear Engineering program utilizes the faculty and research facilities of the Department of Mechanical and Nuclear Engineering to expose students to advanced and emerging technologies in mechanical and nuclear engineering. Research thrusts in the department include but are not limited to smart materials, micro/nanotechnology, energy conversion systems, sensors, aerosol science, nuclear engineering, fluid mechanics, medical devices, robotics and biomechanics.

The M.S. degree program offers a thesis or non-thesis option and can be tailored to meet the individual student's academic goals and research interests. Eighteen to 24 months of full-time study usually are necessary to complete the requirements for the thesis-option. The non-thesis option generally requires 12 months of full-time study or up to four years of part-time study. A time limit of six calendar years, beginning at the time of first registration, is placed on work to be credited toward the master's degree. Generally, a maximum of six credit hours of approved graduate course work required for a master's degree may be transferred from another program at VCU or outside institution and applied toward the degree.

The following are the minimum credit hour requirements for the proposed graduate degree program options:

M.S. thesis option – minimum 30 credit hours including nine credit hours in core courses, 15 credit hours in technical electives (engineering, science or related areas) and six credit hours in directed research EGMN 697

M.S. non-thesis option – minimum 30 credit hours including nine credit hours in core courses and 21 credit hours in technical electives (engineering, science or approved courses)

The mechanical and nuclear engineering M.S. degree program contains three curricular components:

1. **Core component:** This component consists of three required core courses that provide the foundation of the M.S. curriculum. See below for specific course requirements.
2. **Technical elective component:** This component allows the student to take courses in either engineering, science or other areas with approval of the student's adviser and graduate program director.
3. **Directed research component:** This component emphasizes research directed toward completion of M.S. degree requirements under the direction of an adviser and thesis committee.

Depending on the option pursued, students will have to take courses from two or all three of the curricular components. Students should select their concentration component courses based upon their concentration areas. Selecting one concentration area over another does not preclude a student from choosing courses from other areas.

Curriculum requirements

Core requirements

All full-time thesis master's students must register for and attend at least one semester of EGMN 690. Part-time and non-thesis students are not required to register for the seminar, but they are encouraged to attend.

Thesis option

Course	Title	Hours
Core courses, seminar and directed research		
EGMN 605	Mechanical and Nuclear Engineering Analysis	3

EGMN 606	Mechanical and Nuclear Engineering Continuum Mechanics	3
EGMN 610	Topics in Nuclear Engineering	3
Technical elective courses		
With the approval of the adviser or graduate program director, select 15 credit hours of courses with the following subject areas: EGMN, EGRM, ENGR, EGRN, EGRB, EGRE, CLSE, CMSC, PHYS, MATH, NANO, CHEM, BIOL, GRAD, LFSC, OVPR.		15
Directed research		
EGMN 697	Directed Research in Mechanical and Nuclear Engineering	6
Total Hours		30

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Core courses, seminar and directed research		
EGMN 605	Mechanical and Nuclear Engineering Analysis	3
EGMN 606	Mechanical and Nuclear Engineering Continuum Mechanics	3
EGMN 610	Topics in Nuclear Engineering	3
Technical elective courses		
With the approval of the adviser or graduate program director, select 21 credit hours of courses from the following subject areas: EGMN, EGRM, ENGR, EGRN, EGRB, EGRE, CLSE, CMSC, PHYS, MATH, NANO, CHEM, BIOL, GRAD, LFSC, OVPR.		21
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
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Additional contact
Gary C. Tepper, Ph.D.
Professor and chair, Department of Mechanical and Nuclear Engineering
gctepper@vcu.edu
(804) 827-4079

Program website: mechanical-and-nuclear.egr.vcu.edu/academics/graduate (http://mechanical-and-nuclear.egr.vcu.edu/academics/graduate)

COLLEGE OF HEALTH PROFESSIONS

The College of Health Professions was established on Jan. 1, 1969, to provide an administrative structure for existing educational programs in allied health disciplines and to direct the development of new programs in response to the growing need for allied health manpower. At the outset, the college incorporated existing educational programs for hospital administration, medical technology, physical therapy, and radiologic technology and X-ray technicians.

In the years since its establishment, the college has grown significantly — developing unique, cutting-edge curricula and degree offerings in both traditional and nontraditional formats — to meet the increasing demand for allied health teachers, researchers and practitioners. Considered a leader in distance education, VCU's College of Health Professions offers the only interdisciplinary, Internet-based doctoral program in allied health in the country: the Ph.D. in Health Related Sciences. The college currently incorporates nine departments and offers programs at the baccalaureate, certificate, master's and doctoral levels.

Administration

1200 East Broad Street
Box 980233
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(804) 828-7247
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sahp.vcu.edu (http://www.sahp.vcu.edu)

Cecil B. Drain, Ph.D., CRNA, FAAN, FASAHP
Dean

Alexander F. Tartaglia, D.Min.
Senior associate dean

Angela Duncan, Ph.D.
Assistant dean for student affairs and community engagement

Brian T. McMahon, Ph.D., CRC, NCC, CCM
Associate dean for research

Debra A. Ropelewski
Associate dean for fiscal affairs

T. Greg Prince, Ed.D.
Senior director of development

Jeffrey R. Lodge
Director of information technology

Monica White
Coordinator of student affairs and Ph.D. program

Accreditation

The College of Health Professions is an institutional member of the American Society of Allied Health Professions and the Virginia Association of Allied Health Professions. All of its programs are approved or accredited by the appropriate national professional or educational organizations.

Clinical laboratory sciences (bachelor's degree)

National Accrediting Agency for Clinical Laboratory Sciences
5600 N. River Road, Suite 720, Rosemont, IL 60018-5519; (847) 939-3597, (773) 714-8880 or (773) 714-8886 (fax); infor@naacls.org; naacls.org (http://naacls.org). Upon graduation the student is eligible to take the national examination for MLS given by the Board of Certification of the American Society for Clinical Pathology.

Health administration (master's and executive master's degrees)

Commission on Accreditation of Healthcare Management Education

Nuclear medicine technology (bachelor's degree in Clinical Radiation Sciences)

Joint Review Committee on Educational Programs in Nuclear Medicine Technology

Nurse anesthesia (master's, doctorate)

Council on Accreditation of Nurse Anesthesia Educational Programs (COA, 222 South Prospect Avenue, Park Ridge, Illinois, 847-692-7050). The COA is recognized by the U.S. Department of Education and the Council on Higher Education Accreditation to accredit programs of nurse anesthesia at the master's, post-master's and doctoral levels. Graduates of the master's program are eligible to take the examination for certification conducted by the Council on Certification of Nurse Anesthetists.

Occupational therapy (master's degree)

Accreditation Council for Occupational Therapy Education

Patient counseling (certificate)

Association for Clinical Pastoral Education

Physical therapy (D.P.T.)

Commission on Accreditation in Physical Therapy Education, American Physical Therapy Association

Radiation therapy technology and radiography (bachelor's degree in Clinical Radiation Sciences)

Joint Review Committee on Education in Radiologic Technology

Rehabilitation counseling (master's degree)

Council for Accreditation of Counseling and Related Educational Programs

Philosophy

The faculty of the college is committed to offering, through the establishment and maintenance of rigorous standards of excellence, educational programs that will prepare students for professional careers in the allied health disciplines. Development of professional attitudes, emotional maturity and ethical behavior of students is a vital component of the educational process. It is essential that students gain a deep respect for the dignity of human beings and the inherent rights of patients and others who receive services. The programs are designed

to include not only the development of skills to assure excellence in quality of health care, but also factual knowledge and experiences that will provide the basis for continuing intellectual and professional growth.

Community services of the college and faculty include continuing education, consultative resources and participation in all pertinent areas of health care. An integral part of these efforts is to stimulate and sponsor research activities in the allied health disciplines represented within the college and to encourage interdisciplinary research.

Programs

Both entry- and advanced-level undergraduate, graduate, professional and certificate programs are offered by the College of Health Professions. University and accreditation requirements for the individual programs guide the establishment of general admission prerequisites and course and degree requirements. Regulations and procedures for each program are outlined in these bulletins and are intended to ensure the selection of applicants whose motivation, ability, character and health status qualify them to pursue their program of study successfully.

Programs currently offered by this college and the degrees conferred on their graduates are:

College of Health Professions – Dean's Office

- Ph.D. in Health Related Sciences

Department of Clinical Laboratory Sciences

- Bachelor of Science
- Master of Science

Department of Gerontology

- Post-baccalaureate graduate Certificate in Aging Studies
- Post-baccalaureate graduate Certificate in Aging Studies and Master of Social Work (offered jointly with the VCU School of Social Work)
- Master of Science

Department of Health Administration

- Master of Health Administration
- Master of Health Administration and Doctor of Medicine (offered jointly with the VCU School of Medicine)
- Master of Health Administration and Juris Doctor (offered jointly by the T. C. Williams School of Law at the University of Richmond and the Washington and Lee University School of Law)
- Master of Health Administration and Master of Science in Information Systems (offered jointly with the VCU School of Business)
- Master of Science in Health Administration (Professional M.S.H.A. Program – Online)
- Ph.D. in Health Services Organization and Research

Department of Nurse Anesthesia

- Doctor of Nurse Anesthesia Practice
  - Entry-to-practice
  - Post-professional
- Master of Science in Nurse Anesthesia

Department of Occupational Therapy

- Master of Science in Occupational Therapy
- Master of Science in Occupational Therapy and post-baccalaureate graduate Certificate in Aging Studies
- Occupational Therapy Doctorate
  - Entry-to-practice
  - Post-professional

Department of Patient Counseling

- Post-baccalaureate graduate Certificate in Patient Counseling
- Master of Science
- Master of Science and Master of Divinity (offered jointly by the School of Theology at Virginia Union University and the Baptist Theological Seminary)

Department of Physical Therapy

- Doctor of Physical Therapy
- Ph.D. in Rehabilitation and Movement Science

Department of Radiation Sciences

- Bachelor of Science

Department of Rehabilitation Counseling

- Master of Science
- Master of Science in Rehabilitation Counseling and post-baccalaureate graduate Certificate in Aging Studies
- Post-master's Certificate in Professional Counseling

Licensure/certification

Graduates of most of the programs offered in the College of Health Professions are required or eligible to take national and/or state certification or licensure examinations. Requirements of licensing and certifying agencies vary. Some licensure and certification agencies consider individuals convicted of a felony ineligible for licensure or certification. For information, prospective students should contact the licensure or certification agency for the specific allied health discipline.

Attendance regulations

The faculty considers attendance at lectures, laboratories and other functions a requisite to the successful acquisition of the knowledge and skills required of the professional. Hence, the faculty cannot condone absence without good reason from any regularly scheduled educational experience. At the beginning of each course, instructors relate to their classes the policy of the department concerning the attendance regulations for that semester. The nature of make-up work in the event of absence will be the prerogative of the instructor.

Student performance and behavior

The goals and objectives of the College of Health Professions and its component departments and programs relate to the education of persons preparing for professional careers in the allied health disciplines. An integral requisite of students and practitioners is an undeviating acceptance of a professional attitude and pride that will motivate them to adhere to a code of professional ethics and to develop fully their competencies for practice.

The suitability of student performance and behavior relating to these professions and to the consumers of health care is a paramount concern of the administration and faculty of this college. To assure a quality of educational and clinical preparation for its graduates, the following statement is promulgated:

- If, in the judgment of the faculty and administration of the College of Health Professions, a student is not considered suitable for emotional, professional or related reasons, the student's academic status may be appropriately altered.

If any questions arise regarding the standards of performance or behavior, it is the responsibility of students to apprise themselves of acceptable character and conduct requirements prior to matriculation in the designated department or program.

Standards of professional behavior

These standards describe behaviors expected from the faculty and students of the College of Health Professions. They are in addition to those standards of behavior and ethical conduct required by the college's departments and professional organizations. They are supplemental to the university statement regarding conduct in the classroom.

- Recognize one's position as a role model of your profession for other members of the health care team
- Carry out academic, clinical and research responsibilities in a conscientious manner, making every effort to exceed expectations and demonstrating a commitment to lifelong learning
- Treat patients, faculty and students with respect, demonstrating sensitivity to diversity regarding ethnicity, culture, age, gender, disability, social and economic status, sexual orientation, etc., without discrimination, bias or harassment
- Maintain patient/client confidentiality
- Respect the privacy of all members of the campus community and avoid promoting gossip and rumor
- Interact with all members of the health care team in a collaborative and supportive fashion, with respect and recognition of the roles played by each individual
- Provide help or seek assistance for any member of the health care team who is recognized as impaired in his/her ability to perform his/her professional obligations
- Be mindful of the limits of one's knowledge and abilities and seek help from others whenever appropriate
- Abide by accepted ethical standards in the scholarship, research and practice of patient/client care
- Abide by the guidelines of the VCU Honor System

Financial aid

Financial aid is available for all students meeting the criteria for financial assistance. For details of the programs available contact the Financial Aid Office, Box 980244, Richmond, VA 23298-0244 or telephone (804) 828-9800.

The college and departments also offer financial awards, honors and scholarships. Details may be found on the college's and individual departments' websites at sahp.vcu.edu (http://www.sahp.vcu.edu).

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in clinical laboratory sciences

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the

appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Allied Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

Applicants must be certified clinical laboratory scientists or a candidates with equivalent certification.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer

conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3

ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in gerontology

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

An M.S. in Gerontology or other formal academic training in gerontology is preferred.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C.

Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3

ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

Graduate program director
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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in health administration

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

It is recommended that applicants have one to two years experience in the health care industry, and a master's degree in the health professions, public health or business-related disciplines.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

Graduate program director
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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in nurse anesthesia

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the

dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards
The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director.

Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

CRNA certification is required.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in occupational therapy

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic

methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

If a U.S. resident, applicant must be board-certified by NBCOT. International applicants must show certification by the agency that provides certification in the therapist's home country or certification by the World Federation of Occupational Therapists if therapists do not have a certification agency in their home countries.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3

ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in patient counseling

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's

research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

Applicants must be certified as a professional chaplain or certification-eligible.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Program coordinator
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Phone: (804) 828-3273

Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in physical therapy

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director.

Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

If a U.S. resident, the applicant must have a current U.S. physical therapy license. International applicants must show certification by the agency that provides certification in the therapist's home country.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January,

will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3

ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Email: mlwhite1@vcu.edu
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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in radiation sciences

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

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Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

1

Applicants must be certified by one of the following: ARRT, NMTCB or ARDMS.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9

Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

Graduate program director
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Program coordinator
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Phone: (804) 828-3273

Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in rehabilitation leadership

Program mission/purpose

The program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health administration, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

Program goals

1. The program will provide students with the ability to understand and conduct research in health-related sciences.
2. The program will provide the student with the ability to analyze alternatives and develop responses in their disciplines to address the current and future challenges in health care.
3. The program will provide students with the skills to educate health professionals in their discipline using current principles of teaching and curriculum development.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements (p. 26)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/degree-candidacy)

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that

all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation and published research requirements

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements (p. 31)**.** (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements)

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration area must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have a personal computer manufactured within the past two years and access to a high-speed Internet connection.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Tests must have been taken within the past five years.

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will

be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics (including topics such as random variables, probability, distributions, descriptive statistics, hypothesis testing and inferential statistics) with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentration[1]

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

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The ideal candidate will have a master's degree in rehabilitation counseling or eligibility to become a Certified Rehabilitation Counselor, as well as two years of postgraduate professional experience.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of concentration courses and 12 credit hours of dissertation research), two comprehensive examinations, a research proposal defense and the final dissertation defense.

Curriculum structure

The proposed curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the Ph.D. course requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite 51 credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions

pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum requirements

The program curriculum consists of a total of 51 credit hours (18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine hours of specialty concentration courses and 12 hours of dissertation research).

Course	Title	Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three credit hours required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

Semester 1		Hours
ALHP 701	Health Services Delivery Systems	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
	Term Hours:	9
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 708	Ethics and Health Care	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	9
Semester 5		
ALHP 792	Independent Study (three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	3
	Term Hours:	9
Semester 6		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 7		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
Semester 8		
ALHP 899	Dissertation Research (hours variable)	2
	Term Hours:	2
	Total Hours:	51

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Additional contact

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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Nurse Anesthesia Practice, Doctor of (D.N.A.P.)/Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in nurse anesthesia [sequential degrees]

Program mission/purpose

The Ph.D. in Health Related Sciences program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health care outcomes research, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

The sequential D.N.A.P. to Ph.D. concentration meets the growing interest and needs of those D.N.A.P. students who desire a research doctorate. The program integrates content specific to the practice doctorate with content specific to the research doctorate where the Ph.D. portion of the program begins following successful completion of the D.N.A.P. The objective of the program is to prepare certified registered nurse anesthetists holding master's degrees for careers in nurse anesthesia leadership, education and research. Students in this concentration take three courses that are shared between the two individual programs and are able to satisfy program requirements, in part, through distance technology while continuing to maintain their current family and employment obligations.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and

defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Test must have been taken within the past five years

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.
- Students interested in the sequential Doctor of Nurse Anesthesia Practice to Ph.D. in Health Related Sciences concentration must first be admitted to the D.N.A.P. program. Matriculated D.N.A.P. students who wish to enter the combined concentration may apply to the Ph.D. program during the semester preceding graduation from the D.N.A.P. program. Applicants must meet the admission requirements and prerequisites of both programs, be enrolled in the D.N.A.P. program and have demonstrated satisfactory academic performance and professionalism.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Ph.D. program must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentrations

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

Degree requirements

Students in the D.N.A.P. program apply to the Ph.D. in Health Related Sciences program during the last semester in the D.N.A.P. program. Once accepted into the Ph.D. program, students continue with the curriculum as described.

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 75 credit hours (33 credit hours from the D.N.A.P. program and 51 credit hours from the Ph.D. program minus nine credit hours for three shared courses). The Ph.D. curriculum includes 18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of specialty track (courses shared with the D.N.A.P. program), 12 credit hours of dissertation research, two comprehensive examinations, a research proposal defense and the final dissertation defense.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at

VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the degree requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable, unless approved as part of a combined degree program. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum structure

The Ph.D. program curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration areas must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have access to a personal computer and a DSL or cable modem. Once admitted to the program, it is recommended that students who do not feel proficient in computer skills enroll in a basic computer course to become comfortable with use of the Internet and with the basics of document processing software.

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four

graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Curriculum requirements

Course	Title	Hours
Courses		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

D.N.A.P. program requirements

Course	Title	Hours
Fall semester 2		
ALHP 708	Ethics and Health Care	3
Spring semester 2		
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
Fall semester 3		
ALHP 760	Biostatistical Methods for Health Related Sciences	3

Ph.D. in Health Related Sciences

Semester 1		Hours
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
	Term Hours:	3
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	6
Semester 5		
ALHP 792	Independent Study (hours variable; three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	1-9
	Term Hours:	15
Semester 6		
ALHP 899	Dissertation Research (hours variable)	1-9
	Term Hours:	3
Semester 7		
ALHP 899	Dissertation Research (hours variable)	1-9
	Term Hours:	3
Semester 8		
ALHP 899	Dissertation Research (hours variable)	1-9
Dissertation and published research requirements		
	Term Hours:	3
	Total Hours:	51

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Department of Clinical Laboratory Sciences

Teresa S. Nadder, Ph.D., MLS(ASCP)[CM]
Associate professor and chair

Emily M. Hill, Ph.D., MT(ASCP)
Assistant professor and assistant chair

sahp.vcu.edu/departments/cls (http://sahp.vcu.edu/departments/cls)

The Department of Clinical Laboratory Sciences supports the philosophy and mission of the university and the College of Health Professions, and provides an environment that nurtures excellence in education, research and service. The programs offered by the department are dedicated to enhancing and promoting clinical laboratory science. The department fosters fair and equitable educational experiences for students of all ages and diverse backgrounds. Strong affiliations with clinical educators and the integration of innovative technology in the academic setting facilitate both the education and research goals of the department.

The department provides students with superior studies in clinical laboratory science, including both theoretical and applied clinical education, and develops problem-solving expertise, leadership capabilities and communication skills. By providing advanced theoretical and technical education, the graduate program serves to maintain and update the competency of laboratory professionals and to prepare students to assume roles as laboratory supervisors, university educators and researchers. A mature, responsible approach to the acquisition of knowledge is cultivated in order to establish continuing intellectual growth and an enthusiasm for the profession.

The department meets the growing health care needs of the community by providing highly competent and professional clinical laboratory scientists who will be able to function effectively upon entrance into the field and be prepared to explore future scientific and technological advances in laboratory science. And the department promotes continued professional development and personal growth for the faculty and staff to fulfill and balance the individual's abilities and aspirations with the departmental, college and institutional mission and needs. Members of the department conduct themselves in a forthright, ethical manner and practice the highest standard of quality performance.

The objectives of the Department of Clinical Laboratory Sciences are:

- To provide an educational program that prepares students to accurately perform and evaluate analytical tests on body fluids, cells and products
- To foster the development of professional conduct, interpersonal communication skills and ethical principles
- To develop and promote strategies for lifelong learning and to encourage continued professional growth through research, continued education and active participation in professional societies

History

Clinical laboratory scientists have been trained on the MCV Campus since 1927. However, the Department (formerly school) of Medical Technology was not formally established until 1952, at which time the curriculum included six months of didactic experience with lectures and laboratory sessions held in the department, followed by a six-month rotation through the clinical laboratories. The school offered a certificate and/or bachelor's degree program; the certificate program was discontinued during the 1961-62 school year.

In 1974 the curriculum was expanded to the current two-plus-two year program in which students complete 60 semester hours of prerequisites followed by two years of professional course work. The graduate program in clinical laboratory sciences was started in 1967 to provide advanced education for certified medical technologists/clinical laboratory scientists. In 1985 the program was modified to allow candidates holding a degree in another area of science to obtain graduate education in clinical laboratory sciences.

In 1994, the department name was changed to the Department of Clinical Laboratory Sciences. In 2003, an accelerated track was initiated to integrate the undergraduate and graduate programs, which requires completion of two years of prerequisites and three years of full-time professional course work, and leads to the simultaneous awarding of both the bachelor's and master's degrees.

Facilities

The Department of Clinical Laboratory Sciences is located in the Randolph Minor Hall on the MCV Campus. All faculty and clerical offices are located in this facility, as well as student classrooms, general teaching laboratory, computer facilities and a student lounge/reading room.

- Clinical Laboratory Sciences, Master of Science (M.S.), advanced master's concentration (p. 134)
- Clinical Laboratory Sciences, Master of Science (M.S.), categorical concentration (p. 136)
- Clinical Laboratory Sciences, Master of Science (M.S.), accelerated Bachelor of Science in Clinical Laboratory Sciences (B.S.) to master's (p. 139)

Clinical Laboratory Sciences, Master of Science (M.S.), advanced master's concentration

Program goals

The Department of Clinical Laboratory Sciences provides students with advanced theoretical and technical education and prepares them to assume roles as laboratory supervisors, educators and researchers.

Student learning outcomes

1. Demonstrated professional and leadership conduct
2. Demonstrated ability to research and evaluate laboratory issues

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All students will be given a handbook on policies and regulations at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jun 1	Minimum TOEFL of 600 (paper), 250 (computer) or 100 (IBT); or minimum IELTS score of 7.0 for international students whose native language is not exclusively English
	Spring	Nov 1	Satisfactory scores on the GRE

Special requirements

- Applicants holding baccalaureate degrees in clinical laboratory sciences/medical technology and generalist certification by the Board of Certification of the American Society for Clinical Pathology are eligible for the advanced master's concentration.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the general entrance requirements for the Master of Science (M.S.) in Clinical Laboratory Sciences for the advanced master's concentration are:

1. Baccalaureate degree from an accredited college or university with a major in clinical laboratory sciences (medical technology)
2. National certification as a medical laboratory scientist or equivalent level
3. Minimum undergraduate GPA of 3.0 on a 4.0 scale for at least the last two years of undergraduate work
4. Three letters of recommendation from employers or recent instructors addressing academic potential
5. Satisfactory interview

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the advanced master's concentration are required to complete:

1. A minimum of 34 graduate credit hours
2. A research study in the form of a thesis or project related to clinical laboratory sciences
    a. Students selecting the thesis option must complete a minimum of 15 graduate credit hours of discipline-specific sciences and six hours of research.

b. Students selecting the project option must complete 18 graduate credit hours of discipline-specific sciences and four hours of research.

3. In addition to the basic science requirement, each student may choose an area of secondary emphasis in biomedical research, education, management or business.

   a. In lieu of 14 credit hours of discipline-specific courses, students with a secondary emphasis in education, management or business may elect to focus on courses in those areas.

   b. No more than 14 graduate credit hours in the area of the secondary emphasis may be applied toward the required curriculum minimum.

Full-time candidates require a minimum of two academic years to complete the program. Part-time students must complete all work requirements within six years. An interruption in registration in excess of one semester requires prior approval of the department.

Curriculum requirements

Course	Title	Hours
Core		
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
CLLS 690	Clinical Laboratory Sciences Seminar (one-credit course taken three times)	3
CLLS 761	Research Methodology in Clinical Laboratory Sciences	3
CLLS 790	Research in Clinical Laboratory Sciences	4
Discipline-specific courses		
Select 18 credit hours of the following: [1]		18
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOL/BNFO 540	Fundamentals of Molecular Genetics	
CHEM 633	Mass Spectrometry	
CLLS 601	Theoretical Blood Banking	
CLLS 602	Molecular Diagnostics in Clinical Laboratory Sciences	
CLLS 605	Advanced Hematology	
CLLS 608	Laboratory Diagnosis of Infectious Diseases	
FRSC/PHTX 644	Forensic Toxicology	
HGEN 501/ BIOL 530	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
MICR 505	Immunobiology	
MICR 515	Principles of Molecular Microbiology	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis	
PATH 601	General Pathology (Dentistry)	
Electives in business, education, management, marketing, health administration		
Select one of the following: [2]		3
ACCT 507	Fundamentals of Accounting	
ADLT 601	Adult Learning and Development	
ECON 500	Concepts in Economics	
HADM 602	Health System Organization, Financing and Performance	
HADM/ECON 624	Health Economics	
INFO 661	Information Systems for Managers	
MGMT 540	Management Theory and Practice	
MGMT 641	Leading People and Organizations	
MKTG 570	Concepts and Issues in Marketing	
SCMA 530	Fundamentals of the Legal Environment of Business	
Total Hours		34

1

Specific courses will depend on the individual student's choice of specialty. The basic science requirement may be distributed among approved courses listed in the VCU Graduate Bulletin. Other courses may be approved.

2

Other courses may be approved.

Total graduate credit hours required (minimum) 34

Graduate program director
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Clinical Laboratory Sciences, Master of Science (M.S.), categorical concentration

Program goals

The Department of Clinical Laboratory Sciences provides students with advanced theoretical and technical education and prepares them to assume roles as laboratory supervisors, educators and researchers.

Student learning outcomes

1. Demonstrated knowledge and proficiency of laboratory tests in specialized area of study
2. Demonstrated professional and leadership conduct
3. Demonstrated ability to research and evaluate laboratory issues

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All students will be given a handbook on policies and regulations at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jun 1	Minimum TOEFL of 600 (paper), 250 (computer) or 100 (IBT); or minimum IELTS score of 7.0 for international students whose native language is not exclusively English
	Spring	Nov 1	Satisfactory scores on the GRE

Special requirements

- Applicants must possess the essential technical abilities and skills described below.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the general entrance requirements for the Master of Science in Clinical Laboratory Sciences for the categorical concentration are:

1. Baccalaureate degree from an accredited college or university with a major in biology or chemistry (Other majors may be approved with 12 credits of biology and 12 credits of chemistry completed.)
2. Minimum undergraduate GPA of 3.0 on a 4.0 scale for at least the last two years of undergraduate work
3. Three letters of recommendation from recent instructors or professional references from the applicant's intended field of study addressing the applicant's academic and professional abilities and preparation for graduate study
4. Satisfactory interview
5. Essential functions in clinical laboratory sciences
   The VCU Department of Clinical Laboratory Sciences is responsible for providing education without regard to disability while assuring that academic and technical standards are met.
   a. Academic standards are met by successfully completing the curriculum for the M.S. in Clinical Laboratory Sciences degree.
   b. Technical standards represent the essential nonacademic requirements that a student must demonstrate to successfully participate in the M.S. in Clinical Laboratory Sciences degree program. The technical standards for each category identified below are consistent with the expectations of Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 and the ADA Amendments Act of 2008. Applicants must possess the following essential technical abilities and skills for admission consideration:
      i Manual dexterity: Ability to use hand(s) or prosthetic devices with coordination

      ii Fine motor: Ability to manipulate small objects with fingertips or adaptive devices

iii Mobility: Ability to maneuver in the laboratory and around instruments and in patient-care settings

iv Vision: Ability to distinguish red, yellow and blue colors; to distinguish clear from cloudy; and to distinguish objects through a microscope

v Hearing: Ability to hear with assistive devices (i.e., phone receivers, hearing aid, etc.)

vi Speech: Ability to verbally communicate in English

vii Writing: Ability to communicate effectively in written form in English

viii Reading: Ability to read, understand and follow directions printed in English

ix Emotional and physical stability: Ability to work accurately and safely under stress, adapt to changing environments and prioritize tasks

x Personal attributes: Must demonstrate integrity, responsibility, tolerance and respect

Degree requirements

The categorical concentration of the Master of Science program provides specialized study, including a clinical practicum, in one of the following areas: clinical chemistry, hematology, microbiology or immunohematology.

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the categorical concentration are required to complete:

1. A minimum of 34 credit hours of graduate course work while completing undergraduate courses specific to their specializations
2. A six-week clinical practicum in their specialty areas
3. A research study in the form of a thesis or project related to clinical laboratory sciences
4. Students selecting the thesis option must complete a minimum of 15 semester hours of discipline-specific sciences and six hours of research.
5. Students selecting the project option must complete 18 semester hours of discipline-specific sciences and four hours of research.
6. In addition to the basic science requirement, each student may choose an area of secondary emphasis in biomedical research, education, management or business.
7. In lieu of 14 credit hours of discipline-specific courses, students with a secondary emphasis in education, management or business may elect to focus on courses in those areas.
8. No more than 14 credit hours in the area of the secondary emphasis may be applied toward the required curriculum minimum.

Upon completion of the curriculum, students are eligible to take a national certification examination in the area in which they performed their concentrated study.

Full-time candidates require a minimum of two academic years to complete the program. Part-time students must complete all work requirements within six years. An interruption in registration in excess of one semester requires prior approval of the department.

Curriculum requirements

Undergraduate

Course	Title	Hours
Discipline-specific courses		
Select eight to 10 credit hours of the following specialties [1]		8-10
Clinical chemistry specialty		
CLLS 311	Clinical Chemistry and Instrumentation I	
CLLS 312	Clinical Chemistry and Instrumentation II	
Hematology specialty		
CLLS 301	Hematology	
CLLS 302	Abnormal Hematology	
CLLS 304	Urine and Body Fluid Analysis	
Immunohematology specialty		
CLLS 306	Immunohematology	
CLLS 310	Clinical Immunology (other immunology courses may be approved)	
Microbiology specialty		
CLLS 307	Introduction to Pathogenic Microbiology	
CLLS 308	Pathogenic Bacteriology	
Total Hours		8-10

[1] Specific courses will depend on the individual student's choice of specialty. Other courses may be approved.

Total undergraduate credit hours required 8-10

Graduate curriculum

Course	Title	Hours
Core		
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
CLLS 580	Principles of Education/Management	3
CLLS 690	Clinical Laboratory Sciences Seminar (one-credit course completed at least three times; four recommended)	3
CLLS 761	Research Methodology in Clinical Laboratory Sciences	3
CLLS 790	Research in Clinical Laboratory Sciences	4
Discipline-specific courses		
Select 18 credit hours of the following specialties: [1]		18
All specialties		
CLLS 500	Concepts and Techniques in Clinical Laboratory Science	
CLLS 595	Clinical Practicum	
Clinical chemistry specialty		
CHEM 633	Mass Spectrometry	

CLLS 630	Advanced Concepts in Clinical Chemistry and Instrumentation
PHTX/FRSC 644	Forensic Toxicology
Hematology specialty	
CLLS 605	Advanced Hematology
CLLS 629	Advanced Concepts in Hematology
HGEN 501/ BIOL 530	Introduction to Human Genetics
Immunohematology specialty	
CLLS 601	Theoretical Blood Banking
CLLS 627	Advanced Concepts in Immunology and Immunohematology
HGEN 501/ BIOL 530	Introduction to Human Genetics
Microbiology specialty	
CLLS 608	Laboratory Diagnosis of Infectious Diseases
CLLS 628	Advanced Concepts in Microbiology
MICR 515	Principles of Molecular Microbiology
MICR 616	Mechanisms of Viral and Parasite Pathogenesis
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis
Electives for all specialties	
Select of the following (other courses may be approved):	
BIOC 503	Biochemistry, Cell and Molecular Biology
BIOC 504	Biochemistry, Cell and Molecular Biology
BIOL/BNFO 540	Fundamentals of Molecular Genetics
CLLS 602	Molecular Diagnostics in Clinical Laboratory Sciences
HGEN 502	Advanced Human Genetics
MICR 505	Immunobiology
PATH 601	General Pathology (Dentistry)
Electives in business, education, management, marketing, health administration	
Select of the following (other courses may be approved):	
ACCT 507	Fundamentals of Accounting
ADLT 601	Adult Learning and Development
ECON 500	Concepts in Economics
HADM 602	Health System Organization, Financing and Performance
HADM/ECON 624	Health Economics
INFO 661	Information Systems for Managers
MGMT 540	Management Theory and Practice
MGMT 641	Leading People and Organizations
MKTG 570	Concepts and Issues in Marketing
SCMA 530	Fundamentals of the Legal Environment of Business
Total Hours	34

1

Specific courses will depend on the individual student's choice of specialty. Other courses
may be approved.

Total graduate credit hours required (minimum) 34

Graduate program director
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Phone: (804) 828-9469

Program website: sahp.vcu.edu/departments/cls (http://www.sahp.vcu.edu/departments/cls)

Clinical Laboratory Sciences, Master of Science (M.S.), accelerated Bachelor of Science in Clinical Laboratory Sciences (B.S.) to master's

Program goals

The Department of Clinical Laboratory Sciences provides the student with advanced theoretical and technical education and prepares students to assume roles as laboratory supervisors, educators and researchers.

Student learning outcomes

1. Demonstrated professional and leadership conduct
2. Demonstrated ability to research and evaluate laboratory issues

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's

faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All students will be given a handbook on policies and regulations at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Spring	Nov 1	Minimum TOEFL of 600 (paper), 250 (computer) or 100 (IBT); or minimum IELTS score of 7.0 for international students whose native language is not exclusively English
			Satisfactory scores on the GRE

Special requirements

- Applicants pursing the accelerated B.S. to M.S. degree program must initially qualify for admission to the B.S. in Clinical Laboratory Sciences degree program.

The accelerated bachelor's-to-master's-degree program integrates graduate and undergraduate course work and leads to the simultaneous awarding of the Bachelor of Science and Master of Science degrees in clinical laboratory sciences.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Initially qualify for admission to the Bachelor of Science in Clinical Laboratory Sciences program
2. Complete a minimum of 112.5 undergraduate credit hours, including 60 prerequisite undergraduate credit hours (see admission requirements for the baccalaureate degree program in clinical laboratory sciences in the Undergraduate Bulletin for a list of the specific courses) and 52.5 credit hours of undergraduate professional course work in clinical laboratory sciences
3. Have a minimum undergraduate GPA of 3.0 on a 4.0 scale in undergraduate clinical laboratory course work
4. Receive a positive recommendation from the Department of Clinical Laboratory Sciences faculty
5. Have a satisfactory interview

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the accelerated B.S.-to-M.S.-degree program are required to complete:

1. A minimum 40 hours of graduate credit hours
2. A research study in the form of a thesis or project related to clinical laboratory sciences
3. In addition to the basic science requirement, each student may choose an area of secondary emphasis in biomedical research, education, management or business.
    a. In lieu of 14 credit hours of discipline-specific courses, students with a secondary emphasis in education, management or business may elect to focus on courses in those areas.
    b. No more than 14 graduate credit hours in the area of the secondary emphasis may be applied toward the required curriculum minimum.

Beginning with the first semester of the Bachelor of Science in Clinical Laboratory Sciences program, candidates for the accelerated curriculum are expected to be full-time students and complete both the B.S. and M.S. requirements in three years.

Upon completion of the curriculum, students are eligible to take the ASCP BOC national certification examination for a Medical Laboratory Scientist generalist.

Curriculum requirements

Undergraduate

Course	Title	Hours
Prerequisite requirement		
60 credit hours of course work prior to entrance into the Bachelor of Science program in clinical laboratory sciences (Refer to the VCU Undergraduate Bulletin for details of the required courses.)		60
Professional studies requirement		
CLLS 301 & CLLS 302	Hematology and Abnormal Hematology	7.5
CLLS 304	Urine and Body Fluid Analysis	2
CLLS 306	Immunohematology	4.5

CLLS 307	Introduction to Pathogenic Microbiology	3
CLLS 308	Pathogenic Bacteriology	5
CLLS 310	Clinical Immunology	4.5
CLLS 311 & CLLS 312	Clinical Chemistry and Instrumentation I and Clinical Chemistry and Instrumentation II	10
CLLS 337	Clinical Education	1
CLLS 483	Biochemistry Practicum	3
CLLS 485	Hematology Practicum	3
CLLS 493	Clinical Microbiology Practicum	3
CLLS 494	Miscellaneous Clinical Practicum	3
CLLS 496	Blood Bank Practicum	3
Total Hours		112.5

Total undergraduate credit hours required (minimum) 112.5

Graduate studies

Course	Title	Hours
Core		
ACCT 507	Fundamentals of Accounting	3
BIOS/STAT 543	Graduate Research Methods I	3
CLLS 580	Principles of Education/Management	3
CLLS 690	Clinical Laboratory Sciences Seminar	1
CLLS 761	Research Methodology in Clinical Laboratory Sciences	3
CLLS 790	Research in Clinical Laboratory Sciences	3
Electives in business, education, management, marketing, health administration (other courses may be approved)		
Select one of the following:		3
ADLT 601	Adult Learning and Development	
ECON 500	Concepts in Economics	
HADM 602	Health System Organization, Financing and Performance	
HADM/ECON 624	Health Economics	
INFO 661	Information Systems for Managers	
MGMT 540	Management Theory and Practice	
MGMT 641	Leading People and Organizations	
MKTG 570	Concepts and Issues in Marketing	
SCMA 530	Fundamentals of the Legal Environment of Business	
CLLS discipline-specific sciences		
CLLS 627	Advanced Concepts in Immunology and Immunohematology	3
CLLS 628	Advanced Concepts in Microbiology	2
CLLS 629	Advanced Concepts in Hematology	2
CLLS 630	Advanced Concepts in Clinical Chemistry and Instrumentation	2
Electives in discipline-specific courses (other courses may be approved)		
Select 12 credits of the following:		12
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOL/BNFO 540	Fundamentals of Molecular Genetics	
CHEM 633	Mass Spectrometry	
CLLS 601	Theoretical Blood Banking	
CLLS 602	Molecular Diagnostics in Clinical Laboratory Sciences	
CLLS 605	Advanced Hematology	
CLLS 608	Laboratory Diagnosis of Infectious Diseases	
HGEN 501/ BIOL 530	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
MICR 505	Immunobiology	
MICR 515	Principles of Molecular Microbiology	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis	
PATH 601	General Pathology (Dentistry)	
PHTX/FRSC 644	Forensic Toxicology	
Total Hours		40

Total graduate credit hours required (minimum) 40

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Department of Gerontology

Tracey Gendron, Ph.D.
Associate professor and interim chair

The mission of the Department of Gerontology is to promote optimal aging for individuals and communities.

The basic philosophy of the department is to improve the overall well-being of elders through the development of educational programs that are responsive to the changing psychological, physical, social and political needs of our elderly population. Research, community service and continuing education in gerontology and geriatrics are integral parts of this educational effort.

History

The Department of Gerontology was founded in 1976 and offers the only Master of Science in Gerontology in the commonwealth of Virginia. The Department of Gerontology became a part of the now-College of Health Professions in January 1985.

Objectives

The mission to promote optimal aging for individuals and communities is evident through the department's innovative graduate and continuing education, scholarship and university-community partnerships. Graduates further the person-centered, trasndisciplinary mission largely in the areas of administration, education, advocacy and entrepreneurship. The purpose of this program is threefold: (1) to train qualified professionals to work in administrative, planning, service delivery and instructional and staff development positions in programs and services for elders at the national, state and local levels, (2) to provide an opportunity for those studying in other disciplines, and whose work will encompass service to the aged, to integrate their own training with a comprehensive knowledge and understanding of the aging process and (3) to stimulate the design and execution of gerontological research across the multiple disciplines.

Facilities

Offices of the Department of Gerontology are located in the Theater Row building at 730 E. Broad St.

Diversity statement

As faculty, staff and students in the VCU Department of Gerontology in the College of Health Professions:

- We seek to support personhood by honoring the safety, dignity and well-being of all of our constituents.
- We believe that diverse backgrounds and philosophies are crucial to academic excellence.
- We seek to support an academic community whose members have diverse visions, cultures, backgrounds and life experiences.
- We honor freedom of expression and civility of discourse as fundamental educational cornerstones.
- We endeavor to foster a just and inclusive campus culture that promotes both cultural competence and cultural humility.
- We aim to engage members of our community as active citizens in a multicultural world.
- We recognize the need to identify and evaluate the ways in which social, cultural and economic inequities affect power and privilege in the larger society.
- We consider equity and autonomy central to our mission to promote optimal aging for individuals and communities.

Statement of values

As faculty, staff, and students of the VCU Department of Gerontology in the College of Health Professions, we will be guided by this departmental statement of values in the pursuit of our professional and academic endeavors and as we participate in the department's mission to promote optimal aging for individuals and communities. We recognize that this departmental statement of values is informed by the broader VCU Code of Ethics, and that we need to be mindful of our responsibility to adhere to both, as well as to any others which may be applicable to us by virtue of our professional affiliations or other obligations.

Professional competence

We will maintain the highest levels of competence in our work and will undertake only those tasks for which we are qualified by education, training or experience. We will embrace opportunities to work in inter- and transdisciplinary settings with colleagues from a wide range of disciplines, openly acknowledging the boundaries of our gerontological expertise and seeking opportunities to collaborate with other disciplines in our mission to support optimal aging. We recognize the need for continuing education in order to remain professionally competent and we will use the appropriate scientific, professional, technical and administrative resources needed to ensure competence in our professional activities. We will be open to asking for and receiving constructive feedback from others.

Integrity

We will conduct our affairs in ways that inspire trust, confidence and mutual respect and we will communicate candidly within the boundaries of confidentiality. We will strive always to provide an ethical and caring response to ourselves and others. We will use ethical decision-making frameworks and other tools in order to manage ethical dilemmas and other complex problems, working both individually and collaboratively with others. We will not knowingly act in ways that jeopardize either our own or others' welfare and we will appropriately report any concerns about the welfare of older adults. We will always disclose and resolve possible, perceived and actual conflicts of interest in the performance of our professional responsibilities.

Professional and scientific responsibility

We will adhere to the highest scientific, professional and personal standards in pursuing and promoting evidence-based practices and behaviors that support optimal aging across the life span and in a bio-psycho-social-spiritual context. We will show respect for other gerontologists and colleagues of all disciplines even when we disagree on theoretical, methodological or personal approaches to professional activities. We value the continuing establishment of the public trust in the emerging and evolving profession of gerontology and will pursue ethical behavior in order to support that trust. In research and teaching we will adhere to accepted principles for the protection of human participants in research.

Respect for personhood, rights, dignity and diversity

We will respect the personhood, rights, dignity and diversity of all people and will use person-centered, nondiscriminatory language and approaches when engaging with others. We will strive to eliminate bias in our professional activities, through self-reflection, self-awareness and the practice of cultural humility, and we will encourage those with whom we partner to do the same. We will not tolerate any forms of discrimination based on age, gender, race, ethnicity, national origin, religion, sexual orientation, gender identity, disability, health conditions or marital, domestic, parental or socioeconomic status. In all of our work-related activities, we will acknowledge the rights of others to hold values, attitudes and opinions that differ from our own.

Social and advocacy responsibilities

We will maintain awareness of our personal, professional and scientific responsibilities to the communities and societies in which we live and work, making public and applying our evidence-based knowledge in order to contribute to the public good. We will seek to educate ourselves and others about the damaging nature of ageism and through our role-model leadership we will support ourselves and others to promote optimal aging across the lifespan through positive language, behaviors and practices. In undertaking these responsibilities, we will be courageous and compassionate, remaining open to new opportunities, idea, and experiences in all aspects of the field of aging.

- Gerontology, Master of Science (M.S.) (p. 143)

- Aging Studies, Certificate in (Post-baccalaureate graduate certificate) (p. 146)

Opportunities for combined study

The Department of Gerontology, in cooperation with other programs at the university, provides students interested in working with elders or in gerontological settings with the opportunity to complete the Certificate in Aging Studies while also completing requirements for other degree programs, including the Master of Science in Occupational Therapy, Master of Science in Rehabilitation Counseling, Master of Social Work and Doctor of Pharmacy.

- A combination of the Certificate in Aging Studies and the Master of Science in Occupational Therapy (M.S.O.T.) (p. 187), offered jointly with the Department of Occupational Therapy
- A combination of the Certificate in Aging Studies program and a Master of Social Work (M.S.W.) (p. 834), offered jointly with the School of Social Work
- A combination of the Certificate in Aging Studies with the Doctor of Pharmacy (Pharm.D.) (http://bulletin.vcu.edu/professional-studies/pharmacy/pharmacy-pharmd-aging-studies-postbaccalaureate-graduate-certificate-combined), offered with the School of Pharmacy
- A combination of the Certificate in Aging Studies and a Master of Science in Rehabilitation Counseling (M.S.) (p. 211), offered jointly with the Department of Rehabilitation Counseling

Students must apply separately to the participating programs and must meet all admission and degree requirements for both programs. In some cases, and with the approval of the advisers of both programs, course work in one program may be approved to satisfy a course requirement in another program.

Gerontology, Master of Science (M.S.)

Program goal

The Department of Gerontology serves the people of the commonwealth of Virginia and the nation by providing educational programs related to the understanding of aging and promoting optimal aging. The department encourages education through discovery of new knowledge, interdisciplinary interaction, professional behavior and service to the aging network. The department's primary focus is to prepare individuals for positions in the network of aging services. These gerontologists are educated to serve as supporters of optimal aging for older persons and families and caregivers. The master's program provides quality education leading to careers as services providers, educators and researchers. The department's assisted living administration specialty area is NAB-accredited and will prepare students who seek licensure as an assisted living administrator. The department also provides assistance and services to the community and engages in research and scholarly activities related to gerontology.

The goal of the program is to ensure that students in the program will:

1. Understand the biological, psychological and sociological underpinnings of aging in U.S. society as established by Association for Gerontology in Higher Education core competencies.
2. Gain understanding and respect for the interdisciplinary team process in effective gerontological practice.
3. Through a lifespan biopsychosocialspiritual approach, gain understanding of empirically and theoretically based components contributing to optimal quality of life and performance in late life as well as knowledge and skills in best practices to promote optimal aging across the life span.
4. Gain understanding of the existing aging network across federal, state and local levels. Thorough understanding will enable students to successfully identify their niche in the aging network, contribute to a growing field and deliver effective eldercare services.

Student learning outcomes

1. Students will demonstrate understanding and application of the biological, psychological, sociological and spiritual theories of aging to gerontology practice.
2. Students will demonstrate understanding and respect for the interdisciplinary team process in effective gerontological practice and essential role of various disciplines on the care team. Students develop a clearer understanding of eldercare through the biopsychosocial approach, lifespan perspective and the theories within the field (as implicit in AGHE's core competencies).
3. Students will demonstrate a thorough understanding of the multiple paths, methods and techniques of optimal aging in order to assist older persons, their families, program providers and policymakers toward the goal of optimal aging. A comprehensive understanding of gerontology core concepts is essential to this goal.
4. Students will demonstrate an understanding of the aging network and will be able to make contributions to community-identified needs through the successful delivery of services in the aging network. Community engagement will take the form of field work, research, grant writing, service-learning opportunities, education and training.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	June 1	GRE or MAT
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

The program is open to qualified students who have earned a baccalaureate degree from an accredited college or university or the equivalent, maintained a minimum GPA of 3.0 and have satisfactory scores on the GRE or MAT. A successful work experience may strengthen the admission credentials of applicants with marginal records.

Because of the diversity of undergraduate majors, candidates for the gerontology program must present evidence of successful completion of undergraduate courses in the following areas:

1. Biological science – minimum of six credit hours
2. Psychology – minimum of three credit hours
3. Sociology, anthropology or social work – minimum of three credit hours
4. Statistics, research methods or equivalent – minimum of three credit hours (Topics covered in this undergraduate course should be equivalent to those outlined for STAT 212 in the VCU courses database.)

Candidates for admission who do not meet these requirements will be expected to complete the required undergraduate course work or to pass challenge examinations by the end of the first year.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete a 30-credit hour curriculum based on the core curriculum to include either a generalist area of study or one of the following optional specialty areas of study:

Assisted living administration: This specialty area will provide students with a foundation of knowledge in the long-term care continuum. Students electing this option will learn about assisted living, home and community-based services and nursing home care. Educational content is provided that informs students about the different types of services that exist. Students completing this area of study will gain the necessary skills and knowledge required to complete the assisted living administrator licensing exam. This specialty area is NAB-accredited.

Education: This specialty area is designed for students interested in teaching or training careers in gerontology. Students electing this specialty area will be prepared to provide instruction to university or community college students, the lay public, professional service providers and older people.

Health care organization and planning: (in conjunction with the Department of Health Administration) Upon completing this area of study, students will have a foundation of knowledge in health care organization, health planning, health policy and a macro perspective on the financing of health care. In addition, students will have developed skills in policy analysis and the use of economic tools. Finally, students will broaden their understanding of the political, legal and ethical issues involved in health care organization and planning.

Psychogeriatrics: This specialty area, developed jointly with the Department of Psychology, is designed for students interested in working with those older adults and their families who are experiencing psychological difficulty. Students electing this option will be prepared to provide assistance directly to the elderly and their families as well as to consult and train professionals and paraprofessionals to provide more effective mental health services. Training is provided through a combination of specialized didactic instruction and structured field experience in providing direct services, consultation and education.

Public administration: Students who elect to pursue courses in the public administration area, developed jointly with the L. Douglas Wilder School of Government and Public Affairs, will, after completion of course work, be able to plan, organize, report and budget for public programs in aging. Grant writing and program evaluation skills will be developed as well. Students choosing the public administration option may wish to complete the Certificate in Public Management program or the Certificate in Nonprofit Management program.

Research: This specialty area is designed for students who would ultimately like to pursue a doctoral degree in the social or behavioral sciences or in one of the health-related sciences in the College of Health Professions. Students who elect the research option must complete a thesis or a paper of publishable quality. Students will obtain a strong background in experimental psychology research design and methodology and a broad background in life-span developmental theory.

Social services: This option concentrates on developing specialized knowledge and skills in the provision of services to the elderly, basic understanding and skills in at least one method of social work practice, commitment and ability to participate in the development of strategies and policies relevant to amelioration of social problems of the elderly, and the ability to integrate and use in practice knowledge of individual behavior and social structure with particular reference to the needs of the elderly.

Students should consult with their advisers for guidance with scheduling. It is required that students seek advising to determine how they will complete their five practice elective credit hours.

Curriculum requirements

Course	Title	Hours
GRTY 601	Biological and Physiological Aging	3
GRTY/PSYC 602	Psychology of Aging	3
GRTY 603	Social Gerontology	3
GRTY 604	Problems, Issues and Trends in Gerontology	4
GRTY 605	Social Science Research Methods Applied to Gerontology	3
GRTY 606	Aging and Human Values	3
GRTY 607	Field Study in Gerontology	4
GRTY 608	Grant Writing	2
Elective requirement. Select five credit hours from one of the lists below		5
Total Hours		30

Total graduate credit hours required (minimum) 30

Electives [1]

Course	Title	Hours
Assisted living administration		
GRTY 638	Long-term Care Administration	3
GRTY 639	Human Resource Management and Leadership for Gerontologists	1
GRTY 640	Financial Management for Gerontological Leaders	1
Education		
ALHP 591	Special Topics	1-4
GRTY 501	Physiological Aging	3
GRTY 510	Aging	3
GRTY 609	Career Planning	1
GRTY 620	Geriatric Interdisciplinary Team Training	1
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3
GRTY 792	Independent Studies for Master's-/Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	
Health care organization and planning		
ALHP 591	Special Topics	1-4
GRTY 510	Aging	3
GRTY 609	Career Planning	1
GRTY 620	Geriatric Interdisciplinary Team Training	1
GRTY 638	Long-term Care Administration	3
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3
GRTY 792	Independent Studies for Master's-/Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	
Psychogeriatrics		
ALHP 591	Special Topics	1-4
GRTY 501	Physiological Aging	3
GRTY 510	Aging	3
GRTY 609	Career Planning	1
GRTY 610	Gero-pharmacology	1
GRTY 611	Death and Dying	3
GRTY 613	GLBT in Aging	2
GRTY 615	Aging and Mental Disorders	3
GRTY 616	Geriatric Rehabilitation	3
GRTY 624	Community and Community Services for the Elderly	3
GRTY 629	Spirituality and Aging	2-3
GRTY 641	Survey of Psychological Assessment and Treatment of the Older Adult	3
GRTY 642	Practicum in Clinical Geropsychology	3
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3
GRTY 792	Independent Studies for Master's-/Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	
Public administration		
ALHP 591	Special Topics	1-4
GRTY 501	Physiological Aging	3
GRTY 510	Aging	3
GRTY 609	Career Planning	1
GRTY 620	Geriatric Interdisciplinary Team Training	1
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3
GRTY 792	Independent Studies for Master's-/Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	
Additional courses of interest may be available through the Certificate in Public Management.		
Research		
ALHP 591	Special Topics	1-4
GRTY 501	Physiological Aging	3
GRTY 510	Aging	3
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3
GRTY 792	Independent Studies for Master's-/Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	
Social services		
ALHP 591	Special Topics	1-4
GRTY 501	Physiological Aging	3
GRTY 510	Aging	3
GRTY 609	Career Planning	1
GRTY 618	The Business of Geriatric Care Management	3
GRTY 619	Geriatric Care Management Practicum	1-3
GRTY 620	Geriatric Interdisciplinary Team Training	1
GRTY 691	Topical Seminar	3
GRTY 692	Independent Studies	1-3

GRTY 792	Independent Studies for Master's-/ Ph.D.-level Students	3
GRTY 798	Thesis	3-6
or GRTY 799	Thesis	

1

Additional electives, based on areas of interest, may be chosen in consultation with the student's adviser.

Graduate program director
Jennifer Pryor
Department of Gerontology
Email: pryorjm@vcu.edu
Phone: (804) 828-1565

Program website: chp.vcu.edu/gerontology (http://www.sahp.vcu.edu/gerontology)

Aging Studies, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The Department of Gerontology serves the people of the commonwealth of Virginia and the nation by providing educational programs related to understanding of aging and promoting successful aging. The department encourages education through discovery of new knowledge, interdisciplinary interaction, professional behavior and service to the aging network. The department's primary focus is to prepare individuals for positions in the network of aging services. These gerontologists are educated to serve as supporters of optimal aging for older persons and families and caregivers. The certificate program provides quality education to those who are already working with older adults and wish to enhance their services with formal academic training in gerontology or individuals with training in other professions.

The program's goal is to ensure that graduates will be able to demonstrate the ability to apply core gerontological concepts according to Association for Gerontology in Higher Education Core Concepts.

Student learning outcomes

1. Students will understand the biological, psychological and sociological underpinnings of aging in U.S. society.
2. Students will demonstrate understanding of methods and techniques to assist older persons and their families to achieve a successful response to aging.
3. Students will be demonstrate an ability to combine their knowledge of gerontology with experience in the aging network and with knowledge of their core professional discipline so as to contribute to the successful delivery of services in the aging network.
4. Students will develop understanding of and will engage in interdisciplinary approaches to issues and problems of aging.
5. Students enrolled in a dual program will engage in interdisciplinary practice in their core disciplines with special emphasis on gerontology.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Opportunities for combined study

The Department of Gerontology, in cooperation with other programs at the university, provides students interested in working with elders or in gerontological settings with the opportunity to complete the Certificate in Aging Studies while also completing requirements for other degree programs, including the Master of Science in Occupational Therapy, Master of Science in Rehabilitation Counseling, Master of Social Work and Doctor of Pharmacy. Students must apply separately to the participating programs and must meet all admission and degree requirements for both programs. In some cases, and with the approval

of the advisers of both programs, course work in one program may be approved to satisfy a course requirement in another program.

Other information

The program's student handbook is available on the student Blackboard site.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	All semesters		None

The Certificate in Aging Studies program is open to qualified students who have earned a baccalaureate degree from an accredited college or university or the equivalent and who have met all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students in the Certificate in Aging Studies program must complete 21 credit hours of work, including 15 credit hours of core courses and six elective credit hours.

1. Students will complete courses in the biology of aging, psychology of aging, social gerontology and research methods form the basic core of the certificate program.
2. Following the completion of these gerontology courses, students may choose two elective gerontology courses after consultation with their faculty advisers. Advisers counsel students as to the courses that would best suit their educational training needs. Students may choose from aging and human values; topical seminars; independent studies; problems, issues and trends in gerontology; recreation, leisure and aging; and other elective courses.
3. In addition to the completion of these prescribed courses, each candidate for a Certificate of Aging Studies is required to satisfactorily complete a project in gerontology on a subject approved by the faculty. This project may be a comprehensive literature review, a research project or a training or demonstration project. Students register for a three-credit hour course in independent studies (GRTY 692) for this project.

Curriculum requirements

Course	Title	Hours
Required courses		
GRTY 601	Biological and Physiological Aging	3
GRTY/PSYC 602	Psychology of Aging	3
GRTY 603	Social Gerontology	3
GRTY 605	Social Science Research Methods Applied to Gerontology	3
GRTY 692	Independent Studies	3
Elective courses		
Select two of the following:		6
GRTY 604	Problems, Issues and Trends in Gerontology	
GRTY 606	Aging and Human Values	
GRTY 615	Aging and Mental Disorders	
GRTY 616	Geriatric Rehabilitation	
GRTY 691	Topical Seminar	
Other electives approved by adviser		
Total Hours		21

Total graduate credit hours required (minimum) 21

Graduate program director
Jennifer Pryor
Department of Gerontology
Email: pryorjm@vcu.edu
Phone: (804) 828-1565

Program website: chp.vcu.edu/gerontology (http://www.sahp.vcu.edu/gerontology)

Department of Health Administration

Carolyn A. Watts, Ph.D.
Richard M. Bracken Chair

The overall purpose of the Department of Health Administration is to provide top quality education, research and service related to the organization and administration of health care services. Education in health administration at the university began in 1949 with the establishment of a graduate curriculum in hospital administration. Early graduates received a certificate; the master's degree was awarded beginning in 1955.

These early efforts grew and developed into the Department of Health Administration, established in 1972. The department now includes three major programs: Master of Health Administration; Doctor of Philosophy in Health Services Organization and Research; and Master of Science in Health Administration. The latter program, aimed at mid-career professionals, was among the first to offer a health administration degree in a hybrid format (periodic on-campus sessions complemented by online learning in between). The department also cooperates with the schools of law at the University of Richmond and at Washington and Lee University to offer dual-degree programs in health administration and law (M.H.A./J.D.). In 2001, a dual-degree program was established with the VCU School of Medicine (M.H.A./M.D.). Both master's programs are fully accredited by the Commission on Accreditation of Healthcare Management Education. The Department of Health Administration also has a major research program and is involved in a wide range of public service activities, including professional development programs for health services administrators and other health professionals.

Facilities

The department is located in the William Grant House, formerly the Sheltering Arms Hospital, at 1008 E. Clay St., Richmond, Virginia. Built in 1857, the Grant House is on the National Register of Historic Places. VCU Medical Center, one of the largest teaching hospitals in the nation, and other clinical facilities are readily accessible to the department's students and faculty. In addition, the department has clinical affiliations and close working relationships with a large number of health care organizations and agencies in Virginia and throughout the United States. The organizations and agencies are used extensively as clinical facilities in the department's educational programs.

- Health Administration, Master of (M.H.A.) (p. 148)
- Health Administration, Master of (M.H.A.)/Information Systems, Master of Science (M.S.) [combined] (p. 152)
- Health Administration, Master of (M.H.A.)/Juris Doctor (J.D.) from the University of Richmond [combined] (p. 153)
- Medicine, Doctor of (M.D.)/Health Administration, Master of (M.H.A.) [combined] (p. 154)
- Health Administration, Master of Science in (M.S.H.A.) (p. 155)
- Health Services Organization and Research, Doctor of Philosophy (Ph.D.) (p. 159)

Health Administration, Master of (M.H.A.)

Overview and philosophy

The Master of Health Administration program is designed to prepare persons for administrative roles ultimately leading to top-level executive positions in complex health services organizations. The curriculum emphasizes strategic and operational management, thus orienting students toward the broad spectrum of managerial problems and functions likely to be encountered by health services organizations.

The program's educational objectives and content are based upon the premise that a large number of students who select this curriculum aspire to become senior executives of health care organizations at some point in their careers. The graduate M.H.A. program is designed for full-time students.

The M.H.A. program was accredited initially in 1968, one of the first programs in the United States to achieve that status. It has continuously maintained its national accreditation status and in 2017 the program was awarded a seven-year accreditation.

The administrative residency/internship is an integral part of VCU's M.H.A. program. The basic purpose of the residency/internship is to provide students opportunities to apply and further develop their administrative knowledge and skills through a period of applied experience in an operational setting. The administrative residency/internship is supervised directly by experienced executives who serve as the students' preceptors.

Through a carefully selected and organized residency/internship experience, students strengthen the foundation of general knowledge and skills gained through the core curriculum and develop further insight and expertise in their selected concentrations. Students serve their residency/internship in the type of health care organization in which they wish to gain specialized knowledge, skills and experience. Overall policies and guidance for the administrative residency/internship are established by the Department of Health Administration and are included in the administrative residency handbook.

Students become eligible for entrance into the administrative residency/internship after completing specified course work and achieving an overall GPA of 3.0. Students on academic probation or with any incomplete grades during their final on-campus semester prior to their residency may be, at the discretion of the faculty, prevented from entering their residency although their overall GPA is 3.0 or higher. In addition to meeting the academic requirements, the student must, in the judgment of the faculty, present evidence of readiness for a clinical experience by demonstrating sufficient academic proficiency in the core areas of the curriculum and by demonstrating professional maturity. The director of the M.H.A. program or designee has the responsibility to coordinate residency placements. In making these assignments, the director will consider the preferences of the students, the preferences of the preceptors and the recommendations of faculty advisers.

Program goal

The specific mission of the Master of Health Administration program is to prepare early careerists for management and leadership positions within complex health care organizations. The program is nationally accredited and has been consistently ranked in the top five programs in the nation by U.S. News and World Report.

The overall purpose of the Department of Health Administration in which the M.H.A. is housed is to provide top quality education, research and service related to the organization and administration of health care services. The department also has a major research program and is involved in a wide range of public service activities, including professional development programs for health services administrators and other health professionals.

The mission of the Department of Health Administration is to prepare, support and connect exceptional leaders who shape the health care industry. This is accomplished through:

1. Educating the next generation of health administrators and enhancing the skills of the present generation
2. Preparing a new generation of health services researchers and educators
3. Creating and disseminating basic and applied knowledge about the management, organization, financing, function and performance of the health care system
4. Serving people in the public and private sectors of the health care system

These activities, when mutually reinforced among all key people — faculty, staff, students, alumni — elevate the department to a premier status in the United States.

Student learning outcomes

Goal/domain	Competency	Description/learning outcomes
Communication and leadership management		
	Interpersonal communication	Build collaborative relationships and negotiation skills
	Writing skills	Prepare business communications
	Presentation skills	Demonstrate effective oral communication and presentation skills
Leadership		
	Leading and managing others	Hold self and others accountable for organizational goal attainment
	Change management	Promote and manage change
	Ability for honest self-assessment	Demonstrate reflection through self-assessment

	Systems thinking	Be able to assess the potential impacts and consequences of decisions in a broad variety of situations
	Problem-solving and decision-making	Apply evidence-based decision-making techniques to health care questions
Professionalism		
	Personal and professional ethics	Adhere to ethical business principles; exhibit ethical behaviors
	Professional and community contribution	Participate in community service; balance professional and personal pursuits
	Working in teams	Create, participate in and lead teams, including interprofessionalism
Knowledge of the health care environment		
	Health care issues and trends	Demonstrate knowledge of circumstances causing major changes and reform in U.S. health care delivery
	Health care legal principles	Discuss and critically analyze health-related legal principles including standards, regulations and risk management.
	Health policy	Articulate the impact of select health policies on the delivery of health services
	Population health and status assessment	Understand and explain the major factors in health status to health care professionals
Business and analytical skills		
	Financial management	Demonstrate the ability to compile and analyze financial data; develop capital, operating and cash flow budgets; analyze investment data; pro forma development
	Human resources	Apply methods and techniques related to the management of health care organization employees and professional staff
	Organizational dynamics and governance	Understand and be able to explain the roles, responsibilities, structures and influence governing bodies hold in health care organizations
	Strategic planning	Ability to perform environmental analysis; discern competitive strategy; formulate business strategy based on evidence
	Marketing	Analyze and assess markets, market segmentation, strategy, change and innovation
	Information management/ understanding and using technology skills	Apply techniques and methods to plan, design, implement and assess information flow and communication
	Quality improvement/ performance improvement	Apply concepts of process improvement and patient safety to relevant problems
	Quantitative skills	Analyze data and interpret quantitative information
	Planning and managing projects	Design, plan, implement and assess projects related to performance, structure and outcomes of health services
	Economic analysis and application	Analyze and apply economic theory and concepts to business decisions

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations

in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All enrolled students will be provided a handbook at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.H.A.	Fall	Feb 1	GRE/GMAT scores on verbal and quantitative at or above the 50th percentile
		Applications received by Dec 1 are given priority for funding.	For international students: a TOEFL score of 600 (paper-based), 250 (computer-based) minimum

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. Baccalaureate degree from an accredited institution with a 3.0 GPA for all undergraduate work completed
2. Prerequisite course work in microeconomics, financial accounting and business statistics
3. A working knowledge of college-level algebra
4. Transcripts and VCU application forms
5. GRE/GMAT scores on verbal and quantitative at or above the 50th percentile
6. TOEFL scores required for international students
7. Professional resume
8. Three letters of reference
9. Present evidence of personal achievement, scholarship, intellectual ability and professional promise (personal statement)
10. Invited interview with M.H.A. admissions committee

The prerequisite requirements may be met by completing specified courses with a minimum grade of C within the past five years at any accredited college or university.

International applicants must submit evidence of a preapproved residency site in the home country and evidence of financial responsibility.

VCU Honors students are eligible to apply for admission to the M.H.A. program during the junior or senior year of undergraduate study. The application process is the same as for other applicants with the following exceptions: (1) requirements for the GRE or GMAT are waived, (2) application fee is waived and (3) official transcript is not needed (as grades can be accessed in the VCU system). The admission decision will be made by the M.H.A. admissions committee, at which time a place will be reserved for the student, provided the student graduates with honors and completes the prerequisite course work.

Candidates with one to two years of experience are preferred.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete a total of 59 credit hours (including transfer credit hours, if any) to qualify for the Master of Health Administration degree. This requirement includes 48 credit hours of core course work plus at least three credit hours of elective studies in health administration and related disciplines, such as business administration, urban and regional planning, public health and gerontology. In addition, eight credit hours of practicum course work are required as a part of the administrative residency. The graduate program is designed to provide a balanced combination of academic studies and field experience to enable students to achieve the program's educational goals and become well-prepared to enter the field of health administration.

Curriculum requirements

Course	Title	Hours
Courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 607	Financial Management in Health Organizations	3

HADM 608	Seminar in Health Care Finance	3
HADM 609	Managerial Epidemiology	2
HADM 610	Health Analytics and Decision Support	3
HADM 611	Health Care Law and Bioethics	3
HADM 612	Information Systems for Health Care Management	3
HADM 614	Health Care Marketing	3
HADM 615	Health Care Politics and Policy	3
HADM/ECON 624	Health Economics	3
HADM 646	Health Care Organization and Leadership	3
HADM 647	Management of Health Care Organizations	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
HADM 683	Executive Skills II	1
HADM 694	Practicum in Health Administration I	5
HADM 695	Practicum in Health Administration II	3-5
Electives		
Select one of the following: [1]		3
FIRE 638	Real Property Investment Law	
GRTY 603	Social Gerontology	
HADM 692	Independent Study in Health Administration	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 650	Public Health Preparedness	
INFO 661	Information Systems for Managers	
MGMT 637	Advanced Human Resource Management	
MGMT 655	Entrepreneurship	
PADM/GVPA 601	Principles of Public Administration	
PADM/GVPA 625	Public Policy Analysis	
PADM 650	Principles of Nonprofit Management	
SCMA 677	Quality Management and Six Sigma	
Total Hours		59

[1]

The list is suggestive. Other graduate-level courses may be selected by a student, though they should be approved by the program director to ensure they meet requirements.

Total graduate credit hours required (minimum) 59

Sample plan of study

Year one

Fall semester		**Hours**
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 609	Managerial Epidemiology	2
HADM 646	Health Care Organization and Leadership	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
	Term Hours:	14
Spring semester		
HADM 607	Financial Management in Health Organizations	3
HADM 610	Health Analytics and Decision Support	3
HADM 624 or ECON 624	Health Economics or Health Economics	3
HADM 647	Management of Health Care Organizations	3
	Term Hours:	12

Year two

Fall semester		
HADM 608	Seminar in Health Care Finance	3
HADM 612	Information Systems for Health Care Management	3
HADM 615	Health Care Politics and Policy	3
HADM 683	Executive Skills II	1
Elective		3
	Term Hours:	13
Spring semester		
HADM 611	Health Care Law and Bioethics	3
HADM 614	Health Care Marketing	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
	Term Hours:	12

Year three

Fall semester		
HADM 694	Practicum in Health Administration I	5
	Term Hours:	5
Spring semester		
HADM 695	Practicum in Health Administration II	3
	Term Hours:	3
	Total Hours:	59

Graduate program director
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Phone: (804) 828-7799

Program website: had.vcu.edu (http://www.had.vcu.edu)

Health Administration, Master of (M.H.A.)/Information Systems, Master of Science (M.S.) [combined]

Advanced study in health administration and information systems is available through combined degree programs co-sponsored by the Department of Health Administration in the College of Health Professions and the Department of Information Systems in the School of Business.

The combined M.H.A/M.S. program allows students interested in the fields of health management and information technology to earn two highly ranked and relevant master's degrees in just three years, which is the time it usually takes to complete just one of the degrees. The combined degree program is ideal for students who are pursuing careers in health IT management, health IT business consulting or working in the health IT vendor industry.

Applicants for this program are required to meet the admission requirements of each program. For information regarding the dual-degree program, contact the director of the program.

The proposed curriculum allows students to earn both the M.H.A. and the M.S. in Information Systems with a total of 78 credit hours rather than the 89 credit hours that would be required to obtain the degrees separately. The dual-degree option offers this credit-hour efficiency by taking advantage of curricular similarities in the two programs and allowing some courses to count toward both sets of requirements. A total of 12 credit hours will count toward both degrees and the M.H.A. foundation courses will be substituted for the business school foundation course requirements for combined degree students. Students in the combined degree program will follow the same schedule as regular M.H.A. students, including the two lockstep years.

Students will take 51 credit hours of health administration courses required for the M.H.A. and nine additional courses (27 credit hours) in the M.S. in Information Systems program, including INFO 610, INFO 620 and INFO 630. Students whose undergraduate degrees are not in information systems may also be required to take additional undergraduate prerequisite courses before taking the graduate information systems courses, as determined by the program adviser. The HADM 612 course taken for the M.H.A. will substitute for INFO 640, normally required for the M.S. in Information Systems degree, and one of the additional information systems courses will also count toward the elective courses in the M.H.A. program. A three-credit-hour, 10-week internship is required and must have substantial global, entrepreneurial and/or experiential components related to both degrees. The six information systems courses to be taken in addition to INFO 610, INFO 620 and INFO 630, must be approved by the program adviser and would normally be selected to satisfy one of the M.S. in Information Systems concentrations.

Course	Title	Hours
Courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 607	Financial Management in Health Organizations	3
HADM 608	Seminar in Health Care Finance	3
HADM 609	Managerial Epidemiology	2
HADM 610	Health Analytics and Decision Support	3
HADM 611	Health Care Law and Bioethics	3
HADM 612	Information Systems for Health Care Management	3
HADM 614	Health Care Marketing	3
HADM 615	Health Care Politics and Policy	3
HADM/ECON 624	Health Economics	3
HADM 646	Health Care Organization and Leadership	3
HADM 647	Management of Health Care Organizations	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
HADM 683	Executive Skills II	1
HADM 693	Internship in Health Administration	3
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO electives (chosen with permission of adviser)		6
INFO focus area courses (see options below)		12
Total Hours		78

Total graduate credit hours required (minimum) 78

Information systems focus areas

Students must declare a focus in two of the following areas and take the classes offered for each of those two areas for a total of 12 credit hours.

Course	Title	Hours
Business engineering		
INFO 611	Data Re-engineering	3
INFO 632	Business Process Engineering	3
Information assurance		
INFO 622	Internet Security Management	3
INFO 644	Principles of Computer and Information Systems Security	3
Information technology management		
INFO 641	Strategic Information Systems Planning	3
INFO 643	Information Technology Project Management	3
Knowledge engineering		
INFO 614	Data Mining	3
INFO 616	Data Warehousing	3

Sample M.H.A./M.S. in Information Systems plan of study

Year one		
Fall semester		**Hours**
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 609	Managerial Epidemiology	2
HADM 646	Health Care Organization and Leadership	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
Prerequisite HADM or INFO courses if needed		
	Term Hours:	14
Spring semester		
HADM 607	Financial Management in Health Organizations	3
HADM 610	Health Analytics and Decision Support	3
HADM 624 or ECON 624	Health Economics or Health Economics	3
HADM 647	Management of Health Care Organizations	3
Prerequisite HADM or INFO courses if needed		
	Term Hours:	12
Summer semester		
Prerequisite INFO courses if needed		
	Term Hours:	0
Year two		
Fall semester		
HADM 608	Seminar in Health Care Finance	3
HADM 612	Information Systems for Health Care Management	3
HADM 615	Health Care Politics and Policy	3
HADM 683	Executive Skills II	1
INFO course (elective or focus area course from above)		3
Prerequisite INFO courses, if needed		
	Term Hours:	13
Spring semester		
HADM 611	Health Care Law and Bioethics	3
HADM 614	Health Care Marketing	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
	Term Hours:	12
Summer semester		
HADM 693	Internship in Health Administration	3
	Term Hours:	3
Year three		
Fall semester		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO focus area course (from above)		3
	Term Hours:	12
Spring semester		
INFO elective		3
INFO focus area courses (from above)		9
	Term Hours:	12
	Total Hours:	78

Graduate program director
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Program website: had.vcu.edu/prospective/mha (http://sahp.vcu.edu/departments/ha/mha/prospective-students)

Health Administration, Master of (M.H.A.)/Juris Doctor (J.D.) from the University of Richmond [combined]

Advanced study in health administration and law is available through dual-degree programs co-sponsored by the department and the schools of law at the University of Richmond. The program leads to the awarding of the Master of Health Administration and Juris Doctor degrees.

Participants are provided the necessary expertise either to represent clients within the health care industry or to function as legal policy-makers or administrators who fully appreciate the legal environment of the health care field. Applicants for this program are required to meet the admission requirements of each program. For information regarding the dual-degree program, contact the director of the program.

The M.H.A. curriculum sequence of the M.H.A./J.D. degree is shown below. Students take a total of 48 credit hours of M.H.A. course work that includes a three-credit-hour internship.

Course	Title	Hours
Courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 607	Financial Management in Health Organizations	3
HADM 608	Seminar in Health Care Finance	3
HADM 609	Managerial Epidemiology	2
HADM 610	Health Analytics and Decision Support	3
HADM 612	Information Systems for Health Care Management	3
HADM 614	Health Care Marketing	3
HADM 615	Health Care Politics and Policy	3
HADM/ECON 624	Health Economics	3

HADM 646	Health Care Organization and Leadership	3
HADM 647	Management of Health Care Organizations	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
HADM 683	Executive Skills II	1
HADM 693	Internship in Health Administration	3
Total Hours		48

Sample M.H.A./J.D. plan of study

Year one		
Fall semester		**Hours**
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 609	Managerial Epidemiology	2
HADM 646	Health Care Organization and Leadership	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
	Term Hours:	14
Spring semester		
HADM 607	Financial Management in Health Organizations	3
HADM 610	Health Analytics and Decision Support	3
HADM 624 or ECON 624	Health Economics or Health Economics	3
HADM 647	Management of Health Care Organizations	3
	Term Hours:	12
Summer semester		
HADM 693	Internship in Health Administration	3
	Term Hours:	3
Year two		
Fall semester		
HADM 608	Seminar in Health Care Finance	3
HADM 612	Information Systems for Health Care Management	3
HADM 615	Health Care Politics and Policy	3
HADM 683	Executive Skills II	1
	Term Hours:	10
Spring semester		
HADM 614	Health Care Marketing	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
	Term Hours:	9
	Total Hours:	48

Graduate program director
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Additional contact
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Phone: (804) 828-7799

Program website: had.vcu.edu/prospective/mha (http://www.had.vcu.edu/prospective/mha)

Medicine, Doctor of (M.D.)/Health Administration, Master of (M.H.A.) [combined]

Advanced study in health administration and medicine is available through a dual-degree program co-sponsored by the Department of Health Administration and the VCU School of Medicine. The program leads to the awarding of the Doctor of Medicine and Master of Health Administration degrees. The objective of the M.D./M.H.A. program is to provide highly motivated medical students the expertise for management and leadership competency in complex health care organizations. Students may indicate their interest in the combined program prior to matriculation or during the first three years of the M.D. program. The program may be completed in five years. Applicants for this program are required to meet the admission requirements of each program.

For the combined degree program, course work for the M.H.A. is initiated following completion of the first two or three years of the M.D. program, occupies a full academic year (fall, spring and summer) and extends into a second year, and is taken during a hiatus from the third or fourth year of the M.D. program.

Students interested in the program may contact the School of Medicine Office of Curriculum or the director of the M.H.A. program in the Department of Health Administration (College of Health Professions). For additional information refer to the School of Medicine handbook available on the school's website at medschool.vcu.edu (http://www.medschool.vcu.edu).

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

The M.H.A. curricular sequence of the M.H.A./M.D. degree is shown below. Students take a total of 43 credit hours of M.H.A. course work, which includes a three-credit hour internship.

Course	Title	Hours
Courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 607	Financial Management in Health Organizations	3
HADM 610	Health Analytics and Decision Support	3
HADM 611	Health Care Law and Bioethics	3
HADM 612	Information Systems for Health Care Management	3
HADM 614	Health Care Marketing	3
HADM 615	Health Care Politics and Policy	3
HADM/ECON 624	Health Economics	3
HADM 646	Health Care Organization and Leadership	3
HADM 647	Management of Health Care Organizations	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
HADM 682	Executive Skills I	1
HADM 693	Internship in Health Administration	3
Total Hours		43

Total graduate credit hours required (minimum) 43

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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Additional contact
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Program website: had.vcu.edu/prospective/mha (http://www.had.vcu.edu/prospective/mha)

Health Administration, Master of Science in (M.S.H.A.)

Program accreditation
Commission on Accreditation of Health Management Education

Program goal

The Master of Science in Health Administration program mission is to prepare practicing professionals for management and leadership positions within complex health care organizations.

The overall purpose of the Department of Health Administration in which the M.S.H.A. is housed is to provide top quality education, research and service related to the organization and administration of health care services. The department also has a major research program and is involved in a wide range of public service activities, including professional development programs for health services administrators and other health professionals.

The mission of the Department of Health Administration is to prepare, support and connect exceptional leaders who shape the healthcare industry. This is accomplished through:

1. Educating the next generation of health administrators and enhancing the skills of the present generation
2. Preparing a new generation of health services researchers and educators
3. Creating and disseminating basic and applied knowledge about the management, organization, financing, function and performance of the health care system
4. Serving people in the public and private sectors of the health care system

These activities, when mutually reinforced among all key people — faculty, staff, students, alumni — elevate the department to a premier status in the United States.

The M.S.H.A. program is designed for self-motivated, mature and experienced professionals who are seeking advanced preparation in management and administrative roles that ultimately lead to executive positions in complex health services organizations. The curriculum emphasizes leadership in career progression as well as strategic and operational management of health care organizations. The program is

nationally accredited and taught by faculty shared with the department's nationally ranked M.H.A. program.

Student learning outcomes

Goal/domain	Competency	Description/learning outcomes
Communication and relationship management:		
	Interpersonal communication	Build collaborative relationships and negotiation skills
	Writing skills	Prepare business communications
	Presentation skills	Demonstrate effective oral communication and presentation skills
Leadership		
	Leading and managing others	Hold self and others accountable for organizational goal attainment
	Change management	Promote and manage change
	Ability for honest selfassessment	Demonstrate reflection through self-assessment
	Systems thinking	Be able to assess the potential impacts and consequences of decisions in a broad variety of situations
	Problem-solving and decision-making	Apply evidence-based decision-making techniques to health care questions
Professionalism		
	Personal and professional ethics	Adhere to ethical business principles; exhibit ethical behaviors
	Professional and community contribution	Participate in community service; balance professional and personal pursuits
	Working in teams	Create, participate in and lead teams, including interprofessionalism
Knowledge of the health care environment		
	Health care issues and trends	Demonstrate knowledge of circumstances causing major changes and reform in U.S. health care delivery
	Health care legal principles	Discuss and critically analyze health-related legal principles including standards, regulations and risk management.
	Health policy	Articulate the impact of select health policies on the delivery of health services
	Population health and status assessment	Understand and explain the major factors in health status to health care professionals
Business and analytical skills		
	Financial management	Demonstrate the ability to compile and analyze financial data; develop capital, operating and cash flow budgets; analyze investment data; pro forma development
	Human resources	Apply methods and techniques related to the management of health care organization employees and professional staff
	Organizational dynamics and governance	Understand and be able to explain the roles, responsibilities, structures and influence governing bodies hold in health care organizations
	Strategic planning	Ability to perform environmental analysis; discern competitive strategy; formulate business strategy based on evidence
	Marketing	Analyze and assess markets, market segmentation, strategy, change and innovation
	Information management/ understanding and using technology skills	Apply techniques and methods to plan, design, implement and assess information flow and communication
	Quality improvement/ performance improvement	Apply concepts of process improvement and patient safety to relevant problems
	Quantitative skills	Analyze data and interpret quantitative information

	Planning and managing projects	Design, plan, implement and assess projects related to performance, structure and outcomes of health services
	Economic analysis and application	Analyze and apply economic theory and concepts to business decisions

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All enrolled students will receive a student handbook at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.H.A.	Fall	Mar 1	GRE/GMAT scores on verbal and quantitative at or above the 50th percentile
			Applicants who have taken the GRE or GMAT in the past five years may submit previous scores. Those applicants holding certain graduate or professional doctoral degrees (M.D., D.D.S., Pharm.D., Ph.D.) may have the testing requirement waived upon petition.
			TOEFL scores for international students: score of 600 (paper-based), 250 (computer-based) or 100 (Internet-based) minimum

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. Baccalaureate degree from an accredited institution of higher education with a 2.75 GPA for all undergraduate work completed
2. Transcripts and VCU application forms
3. Five years of professional/managerial/health care experience
4. Employed in the health care field
5. Professional resume
6. Three letters of reference
7. Interview with M.S.H.A. admissions committee

Applicants with less than a 2.75 undergraduate GPA who have exceptional professional experience will be considered for admission on provisional status. If the applicant has completed any graduate studies (even if a degree was not awarded), performance in such course work will be considered in the admission decision.

Prerequisites: No specific previous course work is required for application. Upon formal acceptance, students will be provided, at cost, independent-study modules in three areas (microeconomics, accounting and statistics) to be completed prior to beginning the program. Applicants having acceptable previous course work in microeconomics, accounting and statistics may not be required to complete these modules. Generally, courses must be completed within five years of starting the program. The M.S.H.A. program begins in July for the fall semester.

Degree requirements

The M.S.H.A. program is designed to meet the distinctive needs of the experienced health care professional. Courses develop business skills for the unique health care environment so that students are prepared to meet the challenges of the health care marketplace. Classes draw upon the knowledge of the faculty and the diverse group of experienced professionals enrolled.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete 14 courses, a total of 41 credit hours (including transfer credit hours, if any), to qualify for the Master of Science in Health Administration degree. Each semester is composed of both on-campus and off-campus sessions. During the six, approximately week-long, on-campus sessions, students attend professional program classes on the MCV Campus. During off-campus sessions, students continue studies at their homes or work sites, employing a variety of online technologies. Students must successfully complete an integrative capstone case to complete the degree. The competency model utilized by the M.S.H.A. program is operationalized in curricular offerings in the development of learning objectives for individual courses.

Curriculum requirements

Course	Title	Hours
Courses		
HADE 602	Health Systems Organization, Financing and Performance	3
HADE 606	Health Care Managerial Accounting	3
HADE 607	Financial Management in Health Organizations	3
HADE 609	Managerial Epidemiology	2
HADE 610	Health Analytics and Decision Support	3
HADE 611	Health Care Law and Bioethics	3
HADE 612	Information Systems for Health Care Management	3
HADE 614	Health Care Marketing	3
HADE 615	Health Care Politics and Policy	3
HADE 624	Health Economics	3
HADE 646	Health Care Organization and Leadership	3
HADE 647	Management of Health Care Organizations	3
HADE 648	Strategic Management in Health Care Organizations	3
HADE 649	Human Resources Management in Health Care	3
Total Hours		41

Total graduate credit hours required (minimum) 41

Sample plan of study

Full-time enrollment

Semester 1		**Hours**
Fall		
HADE 602	Health Systems Organization, Financing and Performance	3
HADE 624	Health Economics	3
HADE 646	Health Care Organization and Leadership	3
	Term Hours:	9
Semester 2		
Spring		
HADE 606	Health Care Managerial Accounting	3
HADE 610	Health Analytics and Decision Support	3
HADE 615	Health Care Politics and Policy	3
HADE 647	Management of Health Care Organizations	3
	Term Hours:	12
Semester 3		
Fall		
HADE 607	Financial Management in Health Organizations	3
HADE 609	Managerial Epidemiology	2
HADE 611	Health Care Law and Bioethics	3
HADE 612	Information Systems for Health Care Management	3
	Term Hours:	11
Semester 4		
Spring		
HADE 614	Health Care Marketing	3
HADE 648	Strategic Management in Health Care Organizations	3
HADE 649	Human Resources Management in Health Care	3
	Term Hours:	9
	Total Hours:	41

Part-time enrollment

Recognizing the challenge that full-time enrollment brings to busy careers and personal lives, the department offers a part-time enrollment option in the M.S.H.A. program. Part-time students generally enroll in six or eight credit hours per semester and spend an additional 10 months in classes in the program. The recommended part-time schedule is shown below.

Year one		
Fall		**Hours**
HADE 602	Health Systems Organization, Financing and Performance	3
HADE 624	Health Economics	3
	Term Hours:	6
Spring		
HADE 606	Health Care Managerial Accounting	3
HADE 615	Health Care Politics and Policy	3

HADE 647	Management of Health Care Organizations	3
	Term Hours:	9
Year two		
Fall		
HADE 607	Financial Management in Health Organizations	3
HADE 646	Health Care Organization and Leadership	3
	Term Hours:	6
Spring		
HADE 610	Health Analytics and Decision Support	3
HADE 614	Health Care Marketing	3
	Term Hours:	6
Year three		
Fall		
HADE 609	Managerial Epidemiology	2
HADE 611	Health Care Law and Bioethics	3
HADE 612	Information Systems for Health Care Management	3
	Term Hours:	8
Spring		
HADE 648	Strategic Management in Health Care Organizations	3
HADE 649	Human Resources Management in Health Care	3
	Term Hours:	6
	Total Hours:	41

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Program website: had.vcu.edu/prospective/msha (http://www.had.vcu.edu/prospective/msha)

Health Services Organization and Research, Doctor of Philosophy (Ph.D.)

Program goal

The Ph.D. in Health Services Organization and Research program is designed to prepare individuals for careers in teaching, research and consulting at the highest level of capability in the field of health care organizational analysis and health services research. Graduates will be competitive for positions at the nation's top research and teaching institutions, governmental agencies and health care organizations.

Student learning outcomes

Dimension	
Foundational knowledge of health care	Display comprehensive knowledge of the context of health care systems, institutions, actors and environment.
Theoretical knowledge	Apply organizational theoretical and conceptual models relevant to health services research.
Generate research questions and hypotheses	Review, critique and synthesize a body of research, identifying significant gaps in knowledge, methods and study subjects to develop research questions and testable hypotheses.
Study design	Select appropriate interventional (experimental and quasiexperimental) or observational (quantitative, qualitative or mixed) study designs to address health services research questions. Use a conceptual model to specify study constructs and develop valid and reliable variables to measure the constructs.
Data collection and management	Sample and collect primary health and health care data and/or assemble and manage existing data from public or private sources.
Ethical conduct of research	Describe procedures that ensure the ethical and responsible conduct and dissemination of research.
Data analysis and interpretation	Apply rigorous quantitative and qualitative analytical strategies to specific research questions. Demonstrate ability to interpret results of data analysis.
Communication and knowledge transfer	Effectively communicate issues, research findings and implications of health services research verbally and in writing to appropriate professional, scientific, student, policy and lay audiences.
Integration	Develop and conduct original research that includes identifying the research question, selecting the theoretical framework, developing a study design, using appropriate methodologies, conducting the analysis and interpreting the results.

The doctoral program is designed to meet the professional development needs of:

1. Researchers, educators and policy analysts who want to develop in-depth theoretical and research capabilities about health services organizations

2. Clinical professionals who want to acquire a broader perspective on health care organizations and systems and to develop applied research skills in health services organization
3. Administrative professionals who want to prepare for positions as consultants or researchers in complex health organizations

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All enrolled students will be provided a handbook at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall only	Mar 15	GRE or GMAT
		Applications received by Dec 15 are given priority for funding	International students: TOEFL
		(Applications reviewed throughout year)	

Special requirements

- Candidates with one to two years' experience in the health care industry preferred.
- A part-time enrollment option, which requires three years of course work prior to the dissertation research, is also available.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum acceptable standards for admission:

1. Graduate degree (in an academic or professional field) with a minimum GPA of 3.0
2. Working knowledge of college-level algebra
3. Advanced courses in statistics and economics
4. GRE/GMAT scores on verbal and quantitative at or above the 50th percentile
5. TOEFL scores required for international students
6. Transcripts and VCU application forms
7. Three letters of reference
8. Interview with HSOR admissions committee

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 57 credit hours of course work. This includes 48 hours in four major areas of study and nine hours of dissertation study. Students take two written comprehensive examinations, covering health services organization and theory and health services research methods. Eleven credit hours of foundation course work are required. The program director and admissions committee may waive some of these courses. However, the credit hours required for the program are not reduced.

Curriculum requirements

Course	Title	Hours
Foundation courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 624	Health Economics	3
HADM 702	Research in Health Care Financing and Delivery Systems	3

HADM 711	Introduction to Health Services Organization Research I	1
HADM 713	Introduction to Health Services Organization Research II	1
Health services organization theory courses		
HADM 701	Organizational Behavior for Health Services Research	3
HADM 704	Foundations of Health Service Organization Theory	3
HADM 705	Advanced Health Service Organization Theory	3
Theory elective (see list below)		3
Health services research methods courses [1]		
ECON 501	Introduction to Econometrics	3
ECON 612	Econometrics	3
HADM 761	Health Services Research Methods I	3
HADM 763	Applied Health Services Research	3
Method electives (see list below)		6
Specialization courses		
Select elective courses that comprise an area of specialization (see list below) [2]		7
Dissertation research		
HADM 898 & HADM 899	Doctoral Dissertation in Health Services Organization and Research and Doctoral Dissertation in Health Services Organization and Research	9
Total Hours		57

[1] Includes content on such topics as design and analysis, research methods, causal thinking, and multivariate statistical analysis

[2] With adviser's assistance (Courses are generally drawn from other VCU programs and independent study with department faculty.)

Total graduate credit hours required (minimum) 57

Elective courses

Course	Title	Hours
Theory		
BUSN 700	Principles of Scientific Inquiry in Business	3
EPID 600	Introduction to Public Health	3
MGMT 743	Organizing Systems	3
MGMT 750	Attitudes and Motivation in Organizations	3
MGMT 757	Corporate Strategy and Long-range Planning	3
Methods		
BIOS 524	Biostatistical Computing	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
EDUS 711	Qualitative Methods and Analysis	3
MGMT 691	Topics in Management	1-3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
SBHD 610	Behavioral Measurement	3
SCMA 632	Statistical Analysis and Modeling	3
STAT 675	Time Series Analysis I	3
Specialization [1]		
BIOS 524	Biostatistical Computing	3
BUSN 700	Principles of Scientific Inquiry in Business	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
EDUS 711	Qualitative Methods and Analysis	3
ENVS 691	Topics in Environmental Studies	1-3
EPID 600	Introduction to Public Health	3
HADM 792	Independent Study in Health Services Organization and Research	1-3
MGMT 691	Topics in Management	1-3
MGMT 743	Organizing Systems	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
SBHD 610	Behavioral Measurement	3
SCMA 632	Statistical Analysis and Modeling	3
STAT 675	Time Series Analysis I	3

[1] Other electives may be approved by adviser.

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Program website: had.vcu.edu/prospective/phd (http://had.vcu.edu/prospective/phd)

Department of Nurse Anesthesia

Michael D. Fallacaro, D.N.S., CRNA, FAAN
Professor and chair

The program was first organized in 1969 as the School of Nurse Anesthetists, thus becoming the first academic program to be implemented in the newly organized School of Allied Health Professions (now the College of Health Professions).

A letter of intent for a proposed Master of Science in Nurse Anesthesia program was submitted to the commonwealth's Council on Higher Education in 1977. When approved in May 1978, the graduate degree in nurse anesthesia became the first such offering within the profession of nurse anesthesia. While of major importance to the university, it marked a significant milestone for the profession of nurse anesthesia. The first class of graduate students was admitted in the fall of 1979 and

graduated in the fall of 1981. A second hallmark was achieved in 2007 with approval of the Doctor of Nurse Anesthesia Practice program. The first Certified Registered Nurse Anesthetists entered the post-master's DNAP program in January 2008. Soon to mark the beginning of a new era, the program anticipates enrollment of the first cohort of students into the entry-to-practice DNAP option in 2017. The VCU Graduate Council approved this transition in 2015 and the application for approval by the Council on Accreditation of Nurse Anesthesia Educational Programs was submitted in February 2016.

Mission and philosophy

Mission

The mission of Virginia Commonwealth University is to provide a fertile and stimulating environment for learning, teaching, research, creative expression and public service. Essential to the life of the university is a faculty actively engaged in scholarship and creative exploration — activities that increase knowledge and understanding of the world and that inspire and enrich teaching.

The university is dedicated to educating full- and part-time students of all ages and diverse backgrounds in an atmosphere of free inquiry and scholarship so that they may realize their full potential as informed, productive citizens with a lifelong commitment to learning and service.

The mission of the Department of Nurse Anesthesia is to provide learners with the knowledge and skills necessary to work as part of an interprofessional team to serve the public through the delivery of safe, cost-efficient, quality anesthesia services and to develop leaders and scholars who will advance the specialty of nurse anesthesia through research, scholarship and public service. The department achieves this mission by establishing an environment that promotes excellence, values diversity, stimulates creativity and recognizes achievement.

Philosophy

The philosophy of the department reflects the core values of the faculty and provides the foundation for the curriculum. The department's philosophy is synergistic with the mission and goals of VCU and the College of Health Professions.

The department is a social agency dedicated to the education and development of health care professionals in the specialty of nurse anesthesia. Consequently, the faculty recognizes and accepts the responsibility entrusted to it for the learning experiences for its graduate students.

The philosophical orientation of the faculty is that learning is a developmental process through which cognitive, affective and psychomotor behaviors are developed and modified. This process includes the acquisition of information, the transfer and application of knowledge, the evaluation of new skills, and the development of a professional attitude and bearing.

The faculty further subscribes to the belief that the learning process is both positive and rewarding for the student; that it is a transaction between the student and teacher executed through formal and informal processes with an objective to prepare knowledgeable and skillful graduates. Hence, learning is a lifelong process that results in a change in thinking, valuing and behaving. The educational process includes teacher-learner interaction in setting goals, selecting and assessing learning experiences, determining instructional methods, and evaluating the learner's progress. Learning experiences are designed to facilitate continuity in attainment of knowledge, skills and attitudes consistent with educational objectives, the individual needs of students and safe patient care. Students are respected as unique individuals possessing dignity, worth and the right to equity in educational opportunities. Faculty and students share the responsibility for creating an educational climate that reflects democratic values, fosters intellectual inquiry and creativity and encourages the maximum development of each individual's potential.

The American health care system is becoming progressively complex. Technological advances and changing economic patterns foster competition for scarce resources while the patient population is becoming quite diverse. It is increasingly essential for the CRNA to provide care in a manner that collaborates with and values the contribution of other health professionals. As advanced practice nurses working in an ever-changing health care system, CRNAs are well-positioned for roles in research, teaching, policy-making and resource management and as integral members of interprofessional teams.

Graduate education in nurse anesthesia builds upon the education and experiences of the professional registered nurse holding an appropriate baccalaureate degree. Graduates are prepared, through a frame of academic excellence, to become proficient advanced-practice providers and leaders in the specialty and to make scholarly contributions to the health care system and community.

- Nurse Anesthesia Practice, Doctor of (D.N.A.P.) (p. 162)
- Nurse Anesthesia Practice, Doctor of (D.N.A.P.), entry-level (p. 165)
- Nurse Anesthesia Practice, Doctor of (D.N.A.P.)/Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in nurse anesthesia [sequential degrees] (p. 167)
- Nurse Anesthesia Practice, Doctor of (D.N.A.P.)/Nurse Anesthesia, Master of Science in (M.S.N.A.) [combined] (p. 171)
- Nurse Anesthesia, Master of Science in (M.S.N.A.) (p. 174)

Nurse Anesthesia Practice, Doctor of (D.N.A.P.)

Program accreditation
Council on Accreditation of Nurse Anesthesia Educational Programs

Program goal

The mission of the Department of Nurse Anesthesia is to provide learners with the knowledge and skills necessary to work as part of an interprofessional team to serve the public through the delivery of safe, cost-efficient, quality anesthesia services and to develop leaders and scholars who will advance the specialty of nurse anesthesia through research, scholarship and public service. The department achieves this mission by establishing an environment that promotes excellence, values diversity, stimulates creativity and recognizes achievement.

Student learning outcomes

The overall objective of the Doctor of Nurse Anesthesia Practice program is to prepare graduates who have acquired knowledge, skills and competencies in patient safety, perianesthetic management, critical thinking and communication to fulfill their professional responsibility as certified nurse anesthetists.

Upon completion of the program, the graduate will:

1. Apply physiological, safety and organizational theories to promote patient safety, enhance quality care and improve nurse anesthesia practice
2. Analyze and synthesize relevant scientific literature and apply results to improve nurse anesthesia practice and patient care outcomes in a culturally sensitive manner
3. Communicate effectively with patients, families, the public and other health professionals
4. Demonstrate leadership skills to meet the challenges of increasingly complex health care and educational environments impacting nurse anesthetists
5. Develop effective strategies for managing ethical dilemmas inherent in anesthesia patient care and the workplace
6. Employ teaching and learning principles for the nurse anesthetist in educating and counseling individuals, families, students-in-training and groups
7. Demonstrate nurse anesthesia scholarship through presentations, publications, leadership activities and collaboration with other disciplines
8. Utilize technology and information systems to analyze, manage and present data

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
D.N.A.P.	Fall only	Mar 1	GRE within five years of application

Note: Review of applications is ongoing. Preference is given to those received prior to March 1 for fall entry.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must present the following minimum qualifications:

1. A graduate degree from an accredited university
2. Graduation from a nurse anesthesia educational program accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs
3. Certification by the National Board of Certification and Recertification for Nurse Anesthetists
4. Recertification by the National Board of Certification and Recertification for Nurse Anesthetists (if applicable)
5. Current licensure as a registered nurse and advanced practice nurse (as applicable)
6. A minimum cumulative graduate GPA of 3.0 on a 4.0 scale
7. Graduate Record Examination General Test within five years of application
8. Personal statement including:

a. Reasons for seeking this educational opportunity

b. Career goals and how this degree will aid in that process

c. Prior lifework experience that will contribute to your success in the program

d. Potential areas of interest for the capstone project

9. Completed Graduate School application
10. Three professional references
11. Personal interview (by invitation)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), candidates for the degree of Doctor of Nurse Anesthesia Practice must be recommended by the faculty and:

1. Complete all requirements for the prescribed curriculum
2. Complete a capstone project
3. Earn a minimum GPA of 3.0 in all courses
4. Earn a minimum cumulative GPA of 3.0 in all work presented for graduation

Curriculum requirements

Course	Title	Hours
ALHP 708	Ethics and Health Care	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
DNAP/NRSA 701	Human Factors and Patient Safety for Nurse Anesthetists	3
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 789	Nurse Anesthesia Professional Practice	6
DNAP 799	Nurse Anesthesia Capstone Project	6
Total Hours		33

Total graduate credit hours required (minimum) 33

Full-time and part-time planned courses of study

Full-time curriculum - one-year program

Fall semester		Hours
ALHP 708	Ethics and Health Care	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
DNAP 701 or NRSA 701	Human Factors and Patient Safety for Nurse Anesthetists or Human Factors and Patient Safety for Nurse Anesthetists	3
DNAP 789	Nurse Anesthesia Professional Practice	3
	Term Hours:	12
Spring semester		
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 799	Nurse Anesthesia Capstone Project	2
	Term Hours:	11
Summer semester		
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 789	Nurse Anesthesia Professional Practice	3
DNAP 799	Nurse Anesthesia Capstone Project	4
	Term Hours:	10
	Total Hours:	33

Part-time curriculum - two-year program

Year one		
Fall semester		**Hours**
ALHP 708	Ethics and Health Care	3
DNAP 701 or NRSA 701	Human Factors and Patient Safety for Nurse Anesthetists or Human Factors and Patient Safety for Nurse Anesthetists	3
	Term Hours:	6
Spring semester		
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
	Term Hours:	6
Summer semester		
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 789	Nurse Anesthesia Professional Practice	3
	Term Hours:	6
Year two		
Fall semester		
ALHP 760	Biostatistical Methods for Health Related Sciences	3
DNAP 799	Nurse Anesthesia Capstone Project	2
	Term Hours:	5
Spring semester		
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 799	Nurse Anesthesia Capstone Project	2
	Term Hours:	5
Summer semester		
DNAP 789	Nurse Anesthesia Professional Practice	3

DNAP 799	Nurse Anesthesia Capstone Project	2
	Term Hours:	5
	Total Hours:	33

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Program website: sahp.vcu.edu/nrsa (http://www.sahp.vcu.edu/nrsa)

Nurse Anesthesia Practice, Doctor of (D.N.A.P.), entry-level

Program accreditation
Council on Accreditation of Nurse Anesthesia Educational Programs

Program goal

The mission of the Department of Nurse Anesthesia is to provide learners with the knowledge and skills necessary to work as part of an interprofessional team to serve the public through the delivery of safe, cost-efficient, quality anesthesia services and to develop leaders and scholars who will advance the specialty of nurse anesthesia through research, scholarship and public service. The department achieves this mission by establishing an environment that values excellence, stimulates creativity and recognizes achievement.

The department offers an entry-to-practice option to earn the Doctor of Nurse Anesthesia Practice degree. This 36-month, 93-credit-hour B.S. to D.N.A.P. option will include both traditional and hybrid (blended learning) course offerings preparing advanced practice registered nurses with the D.N.A.P. degree while also meeting all requirements for national certification as certified registered nurse anesthetists.

Student learning outcomes

The overall objective of the Doctor of Nurse Anesthesia Practice program is to prepare graduates who have acquired knowledge, skills and competencies in patient safety, perianesthetic management, critical thinking and communication to fulfill their professional responsibility as certified nurse anesthetists.

Upon completion of the program, the graduate will:

1. Apply physiological, safety and organizational theories to promote patient safety, enhance quality care and improve nurse anesthesia practice
2. Analyze and synthesize relevant scientific literature and apply results to improve nurse anesthesia practice and patient care outcomes in a culturally sensitive manner
3. Communicate effectively with patients, families, the public and other health professionals
4. Develop effective strategies for managing ethical dilemmas inherent in anesthesia patient care and the workplace
5. Employ teaching and learning principles for the nurse anesthetist in educating and counseling individuals, families, students-in-training and groups
6. Demonstrate leadership skills to meet the challenges of complex health care and educational environments
7. Demonstrate nurse anesthesia scholarship through presentations, publications, leadership activities and collaboration with other disciplines
8. Utilize technology and information systems to analyze, manage and present data

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
D.N.A.P.	Spring only	Mar 1	GRE within five years of application

Note: Review of applications is ongoing. Preference is given to those received prior to March 1 for spring entry.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must present the following minimum qualifications:

1. Baccalaureate degree in nursing or related science
2. Current, unencumbered licensure as a registered professional nurse in the United States and eligibility to obtain a registered professional nursing license in Virginia (prior to completion of the third semester)
3. Minimum cumulative undergraduate grade point average of 3.0 on a 4.0 scale (preferred)
4. Completion of the Graduate Record Examination within five years of application
5. A minimum of one year full-time work experience, or its part-time equivalent, as a registered nurse in a critical-care setting
6. Personal interview with members of the Admissions Committee (by invitation)
7. Three professional references (one of which must be from the immediate supervisor responsible for performance evaluations, including his or her contact number)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), candidates for the degree of Doctor of Nurse Anesthesia Practice must be recommended by the faculty and:

1. Complete all requirements for the prescribed curriculum
2. Earn a minimum GPA of 3.0 in all DNAP courses
3. Earn a minimum cumulative GPA of 3.0 in all work presented for graduation
4. Meet all clinical requirements as specified by the Council on Accreditation of Nurse Anesthesia Educational Programs and the National Board of Certification and Recertification of Nurse Anesthetists
5. Successfully complete both the Self-Evaluation Examination offered by the National Board of Certification and Recertification of Nurse Anesthetists and a written comprehensive examination

Curriculum requirements

Course	Title	Hours
ALHP 708	Ethics and Health Care	3
DNAP 701	Human Factors and Patient Safety for Nurse Anesthetists	3
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
DNAP 704	Advanced Physiology/Pathophysiology for Nurse Anesthetists I	3
DNAP 705	Advanced Physiology/Pathophysiology for Nurse Anesthetists II	3
DNAP 706	Advanced Pharmacology for Nurse Anesthetists I	3
DNAP 707	Advanced Pharmacology for Nurse Anesthetists II	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 716	Advanced Chemistry and Physics Concepts for Nurse Anesthetists	1
DNAP 717	Advanced Physiological Concepts for Nurse Anesthetists	2
DNAP 718	Advanced Health Assessment for Nurse Anesthetists	3
DNAP 721	Clinical Practicum I	3
DNAP 722	Clinical Practicum II	4
DNAP 723	Clinical Practicum III	5
DNAP 724	Clinical Practicum IV	5
DNAP 725	Clinical Practicum V	5
DNAP 731	Professional Aspects of Nurse Anesthesia Practice	3
DNAP 733	Evidence-based Decision-making in Nurse Anesthesia	3
DNAP 734	Research Methods and Statistical Measures in Nurse Anesthesia Practice	3
DNAP 735	Principles and Practice of Nurse Anesthesia Practice I	4
DNAP 736	Principles and Practice of Nurse Anesthesia II	3
DNAP 737	Principles and Practice of Nurse Anesthesia III	3
DNAP 738	Principles and Practice of Nurse Anesthesia IV	2
DNAP 739	Principles and Practice of Nurse Anesthesia V	2
DNAP 789	Nurse Anesthesia Professional Practice	6
DNAP 799	Nurse Anesthesia Capstone Project	6
Total Hours		93

Planned course of study

Year one

Spring semester		Hours
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
DNAP 731	Professional Aspects of Nurse Anesthesia Practice	3

DNAP 733	Evidence-based Decision-making in Nurse Anesthesia	3
	Term Hours:	9
Summer semester		
DNAP 716	Advanced Chemistry and Physics Concepts for Nurse Anesthetists	1
DNAP 717	Advanced Physiological Concepts for Nurse Anesthetists	2
DNAP 718	Advanced Health Assessment for Nurse Anesthetists	3
	Term Hours:	6
Fall semester		
DNAP 704	Advanced Physiology/Pathophysiology for Nurse Anesthetists I	3
DNAP 706	Advanced Pharmacology for Nurse Anesthetists I	3
DNAP 735	Principles and Practice of Nurse Anesthesia Practice I	4
	Term Hours:	10
Year two		
Spring semester		
DNAP 705	Advanced Physiology/Pathophysiology for Nurse Anesthetists II	3
DNAP 707	Advanced Pharmacology for Nurse Anesthetists II	3
DNAP 721	Clinical Practicum I	3
DNAP 736	Principles and Practice of Nurse Anesthesia II	3
	Term Hours:	12
Summer semester		
DNAP 722	Clinical Practicum II	4
DNAP 734	Research Methods and Statistical Measures in Nurse Anesthesia Practice	3
DNAP 737	Principles and Practice of Nurse Anesthesia III	3
	Term Hours:	10
Fall semester		
ALHP 708	Ethics and Health Care	3
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 723	Clinical Practicum III	5
DNAP 738	Principles and Practice of Nurse Anesthesia IV	2
	Term Hours:	13
Year three		
Spring semester		
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 724	Clinical Practicum IV	5
DNAP 739	Principles and Practice of Nurse Anesthesia V	2
	Term Hours:	13
Summer semester		
DNAP 725	Clinical Practicum V	5
DNAP 799	Nurse Anesthesia Capstone Project	6
	Term Hours:	11
Fall semester		
DNAP 701	Human Factors and Patient Safety for Nurse Anesthetists	3
DNAP 789	Nurse Anesthesia Professional Practice	6
	Term Hours:	9
	Total Hours:	93

Graduate program director
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Program website: sahp.vcu.edu/nrsa (http://www.sahp.vcu.edu/nrsa)

Nurse Anesthesia Practice, Doctor of (D.N.A.P.)/Health Related Sciences, Doctor of Philosophy (Ph.D.) with a concentration in nurse anesthesia [sequential degrees]

Program mission/purpose

The Ph.D. in Health Related Sciences program will provide experienced health professionals with advanced knowledge and skills so that they may assume positions in teaching, research and administration upon graduation. It offers a curriculum with an interdisciplinary core of courses with concentrations in clinical laboratory sciences, gerontology, health care outcomes research, nurse anesthesia, occupational therapy, patient counseling, physical therapy, radiation sciences and rehabilitation leadership. The program emphasizes use of distance-learning technologies combined with traditional didactic methods. The curriculum is relevant, timely and meaningful to a multidisciplinary cohort of students.

The sequential D.N.A.P. to Ph.D. concentration meets the growing interest and needs of those D.N.A.P. students who desire a research doctorate. The program integrates content specific to the practice doctorate with content specific to the research doctorate where the Ph.D. portion of the program begins following successful completion of the D.N.A.P. The objective of the program is to prepare certified registered nurse anesthetists holding master's degrees for careers in nurse anesthesia leadership, education and research. Students in this concentration take three courses that are shared between the two individual programs and are able to satisfy program requirements, in part, through distance technology while continuing to maintain their current family and employment obligations.

Student learning outcomes

Students completing this doctoral program will:

1. Demonstrate the ability to conduct research, understand issues, design and execute research plans, analyze research results, and present conclusions in the area of interdisciplinary health care using the appropriate methods
2. Demonstrate an in-depth knowledge in the area of specialization
3. Exhibit competency in translating research knowledge and principles into applied practice perspectives and skills
4. Display educational expertise in current principles and content of the allied health sciences and teach in the area of interdisciplinary health care practice
5. Display the ability to examine current issues and future changes in the health care environment from an interdisciplinary perspective
6. Exhibit knowledge and understanding of professional and ethical responsibility and conduct in the allied health professions
7. Demonstrate knowledge and understanding of the importance of cultural diversity in the delivery of health care and the formulation of health policy

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Program completion requirements

The doctor of philosophy degree is awarded after (1) the minimum 51 credit hours of course work are completed, (2) comprehensive exams are passed, and (3) either a dissertation is written and defended orally or three first-author articles of publishable quality (on research undertaken by the doctoral candidate once enrolled in the program) are written and defended orally. The journal articles will be scrutinized for quality of scholarship by an internal research committee headed by the student's research adviser. All three articles must be approved by the internal research committee prior to submission.

Other information

Student handbook

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Facilities

The administrative offices for the program are located on the MCV Campus, at 1200 E. Broad St. (West Hospital, First Floor, East Wing).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (begins end of Jun)	Mar 15	GRE or MAT
			Test must have been taken within the past five years

Special requirements

- When applicable, applicants must have a minimum Test of English as a Foreign Language score of 600. The Ph.D. program in health related sciences utilizes two six-month semesters per year (January through June and July through December), which include both on- and off-campus components.
- Students interested in the sequential Doctor of Nurse Anesthesia Practice to Ph.D. in Health Related Sciences concentration must first be admitted to the D.N.A.P. program. Matriculated D.N.A.P. students who wish to enter the combined concentration may apply to the Ph.D. program during the semester preceding graduation from the D.N.A.P. program. Applicants must meet the admission requirements and prerequisites of both programs, be enrolled in the D.N.A.P. program and have demonstrated satisfactory academic performance and professionalism.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Ph.D. program must meet the following criteria:

1. Have an earned master's degree in an academic or allied health-related field from an accredited college or university; preference will be given to applicants who have a minimum cumulative GPA of 3.3 on master's-level work (The master's degree should be in one of the departmental areas of choice of concentration.)
2. Have GRE (verbal, quantitative and analytic writing) or MAT scores from within the past five years
3. Have completed a graduate course in statistics with a minimum grade of B
4. Demonstrate a record of professional competency and success
5. Articulate clear professional and educational goals and written communication skills through the submission of a written essay
6. Have any additional qualifications/certifications of the individual concentrations

Prior to reviewing an application for admission, the program must receive:

1. A completed application form from the applicant, including:
   a. Three letters of recommendation, two of which preferably are from sources qualified to assess the candidate's academic potential
   b. A written essay that discusses career goals and the manner in which this doctoral program will enhance those goals and what the applicant expects to contribute to this program
   c. A curriculum vitae
2. Official transcripts indicating completion of baccalaureate and master's degrees (or equivalent) from an accredited college or university
3. GRE or MAT scores

Incomplete packages may not be reviewed. Materials are sent to the Graduate Admissions office for processing and then forwarded to the College of Health Professions. Once received in the college, the application is reviewed for completeness. Applicants with incomplete files will be contacted regarding the missing materials. Incomplete files will be held in the director's office until all materials are received.

Completed folders will be sent to the respective departmental representative of the College of Health Professions doctoral program advisory committee. Departments will then rank qualified applicants and, based on a review of the file, a personal interview will be scheduled at the department's discretion for the top candidates. Following the departmental ranking, all files will be returned to the director's office.

The DPAC will meet to select and recommend the incoming class. The director and the dean of the College of Health Professions are responsible for the final decision.

Applicants will be notified by the Graduate Admissions office regarding the admission decision and of the deadline for their acceptance of the offer and holding fee.

Degree requirements

Students in the D.N.A.P. program apply to the Ph.D. in Health Related Sciences program during the last semester in the D.N.A.P. program. Once accepted into the Ph.D. program, students continue with the curriculum as described.

In addition to general VCU Graduate School graduation requirements (p. 31), students must successfully complete a total of 75 credit hours (33 credit hours from the D.N.A.P. program and 51 credit hours from the Ph.D. program minus nine credit hours for three shared courses). The Ph.D. curriculum includes 18 credit hours of common interdisciplinary core courses, 12 credit hours of research methods core courses, nine credit hours of specialty track (courses shared with the D.N.A.P. program), 12 credit hours of dissertation research, two comprehensive examinations, a research proposal defense and the final dissertation defense.

Continuation requirements

After admission to the Ph.D. program, the student must maintain a minimum cumulative GPA of 3.0 in all of the course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency. Even with an overall minimum GPA of 3.0, a student may earn no more than two (six credit hours) grades of C. Students who receive a grade of D or F will be reviewed for continuation in the program by the department of their concentrations.

Students are expected to maintain continuous enrollment while in the program. Following the completion of the core course work, students must register for at least one credit hour each fall and spring semester for continuation in the program. A student who fails to register must have advance approval to do so or will be dropped automatically from the program and must reapply for reinstatement. The maximum time to complete all of the requirements for the degree is eight calendar years from the date of entry into the program.

Course transfer or waiver

A maximum of 25 percent of the course work other than research may be transferred from another VCU program or outside institution and applied toward the degree requirements. Transfer and waiver credit is given at the discretion of the program director after consultation with appropriate faculty members, subject to university approval. Courses taken as requirements for other degrees are not transferable, unless approved as part of a combined degree program. A waiver may be warranted if an equivalent course was taken. However, another course must be substituted for the waived course in order to fulfill the requisite credit hours needed for degree completion.

Comprehensive examination

The purpose of the comprehensive examination is to provide a vehicle through which students can demonstrate the ability to integrate their educational experiences by adequately addressing complex questions pertinent to the current and developing knowledge of the allied health fields. Students are eligible to take each of the two comprehensive examinations upon successful completion of the appropriate core course work. The core exam must be taken within six months of completing the methods exam.

Two written examinations will be administered, one for the common interdisciplinary core and one for the research methods core. A three-member graduate faculty committee will develop and administer each exam. This committee will be made up of two members of the core faculty and one member appointed by the program director. Each exam will be offered once in the fall semester and once in the spring semester. Prior to completion of the semester in which students become eligible to take each exam, they must submit a formal statement of intent to the program coordinator.

Students who receive a failing grade on the initial attempt will have one opportunity to repeat each comprehensive examination. Failure to pass an exam on the second attempt will result in dismissal from the program.

Curriculum structure

The Ph.D. program curriculum is designed to take four years to complete. Students spend the first two and one-half years (six-month-long semesters) completing course work. The final year and one-half is spent developing the doctoral dissertation. Research components are present in each year of the program, and a research emphasis is present throughout the entire curriculum. Students are required to designate the area of intended research in their concentration areas in the first year.

Each of the five course-work semesters is composed of both on- and off-campus components. On-campus sessions, scheduled during the end of June and beginning of July and at the beginning of January, will employ a rather traditional mix of educational technologies (e.g., lectures, seminars and assigned reading). During the off-campus component of each semester, students pursue their studies employing a wide variety of innovative educational technologies (e.g., computer conferencing, computer-aided instruction, videotape packages and programmed instructional material), in addition to assigned readings and the completion of various assignments and projects. Upon completion of the five semesters of course work, students are required to return to campus each semester until a research proposal has been developed and successfully defended.

Advising

Upon admission to the program, students will be assigned an interim adviser to guide them through the core courses and assist them as they consider their areas of research. All program advisers will have an earned doctorate and be members of the university's graduate faculty.

Students may change their interim advisers as their programs of study and interests evolve, if approved by the program director. Although discouraged, some students may wish to switch their area of concentration (changing from the department through which they were initially admitted to the program). Students who want to change concentration areas must petition the doctoral program director. The petition must be approved by the program director, the DPAC and the appropriate department chair. There is no guarantee that the applicant will be accepted into the new concentration.

After successful completion of the comprehensive examinations, students will choose a dissertation chair that will serve as adviser and guide them through the research/dissertation process.

Computer requirements

All students admitted to the program must have access to a personal computer and a DSL or cable modem. Once admitted to the program, it is recommended that students who do not feel proficient in computer skills enroll in a basic computer course to become comfortable with use of the Internet and with the basics of document processing software.

Admission to candidacy

Students are eligible to begin their dissertations upon written certification by the program director and associate dean of the Graduate School that all predissertation/research requirements, including the comprehensive examinations, have been satisfied and that the student is prepared to proceed with the dissertation/research project. Copies of the certification will be forwarded to the student, the student's formal program adviser and the dean of the College of Health Professions. After admission to candidacy, students will proceed to propose, complete and defend their dissertations or three journal articles research requirement.

Enrollment requirement

Students are required to maintain continuous enrollment in ALHP 899 until completion of the requirements, including the defense process.

Dissertation/research committee

After successful completion of the comprehensive exam, the student nominates a dissertation/research committee, and the dissertation/research director submits the nominations in writing to the program director. Such committees will consist of a minimum of four graduate faculty members, one of whom will be outside the student's concentration area. The program director will provide written approval of the dissertation/research committee and clear such appointments with the appropriate administrative officials.

Dissertation/research standards

The dissertation or publishable research articles must represent independent research and should be based on an original research question or hypothesis. Generally, dissertations or publishable research articles will demonstrate the student's ability with empirical research, adhering to canons of (1) logic in conceptualization and design, (2) valid and reliable measurement, (3) appropriate analytic technique and (4) appropriate interpretation of results. Studies should be based on a formal theoretical or conceptually explicit framework for investigating a question or testing a hypothesis relevant to the allied health field.

Curriculum requirements

Course	Title	Hours
Courses		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 708	Ethics and Health Care	3
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 718	Health Informatics	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
ALHP 792	Independent Study (three required)	1-4
ALHP 793	Research Practicum	3
ALHP 890	Dissertation Seminar	3
ALHP 899	Dissertation Research	9

DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
Total Hours		51

Total graduate credit hours required (minimum) 51

Sample plan of study

D.N.A.P. program requirements

Course	Title	Hours
Fall semester 2		
ALHP 708	Ethics and Health Care	3
Spring semester 2		
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
Fall semester 3		
ALHP 760	Biostatistical Methods for Health Related Sciences	3

Ph.D. in Health Related Sciences

Semester 1		Hours
ALHP 712	Curriculum and Communication Design for Health Care Professionals	3
	Term Hours:	3
Semester 2		
ALHP 702	Finance and Economic Theory for Health Care	3
ALHP 761	Health Related Sciences Research Design	3
ALHP 762	Multivariate Statistical Methods for Health Related Sciences Research	3
	Term Hours:	9
Semester 3		
ALHP 718	Health Informatics	3
ALHP 763	Clinical Outcomes Evaluation for Health Related Sciences	3
ALHP 781	Doctoral Seminar in Health Related Sciences	3
Methods comprehensive exam		
	Term Hours:	9
Semester 4		
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
ALHP 890	Dissertation Seminar	3
Core comprehensive exam		
	Term Hours:	6
Semester 5		
ALHP 792	Independent Study (hours variable; three hours required)	3
ALHP 793	Research Practicum	3
ALHP 899	Dissertation Research (nine hours required)	1-9
	Term Hours:	15
Semester 6		
ALHP 899	Dissertation Research (hours variable)	1-9
	Term Hours:	3
Semester 7		
ALHP 899	Dissertation Research (hours variable)	1-9
	Term Hours:	3
Semester 8		
ALHP 899	Dissertation Research (hours variable)	1-9
	Term Hours:	3
	Total Hours:	51

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Program website: sahp.vcu.edu/phd (http://www.sahp.vcu.edu/phd)

Nurse Anesthesia Practice, Doctor of (D.N.A.P.)/Nurse Anesthesia, Master of Science in (M.S.N.A.) [combined]

Program accreditation
Council on Accreditation of Nurse Anesthesia Educational Programs

Program goal

The mission of the Department of Nurse Anesthesia is to provide learners with the knowledge and skills necessary to work as part of an interprofessional team to serve the public through the delivery of safe, cost-efficient, quality anesthesia services and to develop leaders and scholars who will advance the specialty of nurse anesthesia through research, scholarship and public service. The department achieves this mission by establishing an environment that promotes excellence, values diversity, stimulates creativity and recognizes achievement.

Student learning outcomes

In addition to the learning outcomes of the individual M.S.N.A. and D.N.A.P programs, graduates of the combined M.S.N.A./D.N.A.P. program will be able to:

1. Apply physiological, safety and organizational theories to promote patient safety, enhance quality care and improve nurse anesthesia practice
2. Analyze and synthesize relevant scientific literature and apply results to improve nurse anesthesia practice and patient care outcomes in a culturally sensitive manner
3. Communicate effectively with patients, families, the public and other health professionals
4. Develop effective strategies for managing ethical dilemmas inherent in anesthesia patient care and the workplace
5. Employ teaching and learning principles in educating and counseling individuals, families, students-in-training and groups

6. Demonstrate leadership skills to meet the challenges of complex health care and educational environments
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A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Other information

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.N.A.	Fall only	Jun 1	GRE
D.N.A.P.			

Note: Review of applications is ongoing. Preference is given to applications received prior to June 1 for fall entry.

Master of Nurse Anesthesia students with a minimum GPA of 3.25 are eligible to apply to the combined M.S.N.A. and D.N.A.P. program during the third semester of study. Students enrolled in the M.S.N.A./D.N.A.P. combined degree option will graduate with the master's degree in nurse anesthesia at the end of the seven-semester, 28-month master's curriculum and take the national certification exam. These students will then continue their doctoral studies (largely via distance) in the eighth semester (spring) to graduate with the Doctor of Nurse Anesthesia Practice degree at the end of the eighth semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. Currently enrolled and in good academic standing in VCU's M.S.N.A. program
2. Current licensure as a registered nurse and advanced practice nurse (as applicable)
3. A cumulative minimum graduate GPA of 3.25 on a 4.0 scale
4. Graduate Record Examination general test within five years of application
5. Personal statement including:
    a. Reasons for seeking this educational opportunity
    b. Career goals and how this degree will aid in that process
    c. Prior lifework experience that will contribute to your success in the program
    d. Potential areas of interest for the capstone project
6. Completed Graduate School application to D.N.A.P. program by July 1 of year graduating from M.S.N.A. program
7. Three professional references
8. Personal interview (by invitation)
9. M.S.N.A./D.N.A.P. students must pass the National Certification Examination to be eligible for graduation from the D.N.A.P. component of the M.S.N.A./D.N.A.P. program.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students in the combined program must complete a minimum of 97 credit hours (98 with elective).

Curriculum requirements

Course	Title	Hours
ALHP 708	Ethics and Health Care	3
ALHP 760	Biostatistical Methods for Health Related Sciences	3
DNAP/NRSA 701	Human Factors and Patient Safety for Nurse Anesthetists	3
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 712	Leadership in Nurse Anesthesia Education	3
DNAP 789	Nurse Anesthesia Professional Practice	6
DNAP 799	Nurse Anesthesia Capstone Project	6
MEDC 532	Medicinal Chemistry for Nurse Anesthetists	3
NRSA 601	Principles and Practice of Nurse Anesthesia I	3
NRSA 602	Principles and Practice of Nurse Anesthesia II	3
NRSA 603	Principles and Practice of Nurse Anesthesia III	3
NRSA 604	Principles and Practice of Nurse Anesthesia IV	2
NRSA 605	Principles and Practice of Nurse Anesthesia V	2
NRSA 611	Advanced Physiological Concepts for the Nurse Anesthetist (elective) [1]	1
NRSA 620	Advanced Health Assessment for Nurse Anesthetists I	1
NRSA 621	Advanced Health Assessment for Nurse Anesthetists II	1
NRSA 622	Clinical Practicum I-II	1
NRSA 623	Clinical Practicum I-II	3
NRSA 624	Clinical Practicum III	6
NRSA 625	Clinical Practicum IV	6
NRSA 626	Clinical Practicum V	6
NRSA 633	Pathophysiology for Nurse Anesthetists	3
NRSA 642	Professional Aspects of Anesthesia Practice I	1
NRSA 645	Professional Aspects of Anesthesia Practice II	1
NRSA 647	Professional Aspects of Anesthesia Practice III	1
NRSA 683	Research Methods in Nurse Anesthesia Practice	3
NRSA 684	Evidence-based Decision Making in Nurse Anesthesia	3
NRSZ 601	Laboratory in Principles and Practice of Nurse Anesthesia I	1
PHIS 501	Mammalian Physiology	5
PHTX 515	Pharmacology for Nurse Anesthetists I	3
PHTX 516	Pharmacology for Nurse Anesthetists II	3
Total Hours		97

Total graduate credit hours required (minimum) 97 [1]

[1]Completing NRSA 611, an elective course, brings curriculum total to 98 hours.

Sample plan of study

Year one

Fall semester		**Hours**
NRSA 601	Principles and Practice of Nurse Anesthesia I	3
NRSA 611	Advanced Physiological Concepts for the Nurse Anesthetist (elective) [1]	1
NRSA 620	Advanced Health Assessment for Nurse Anesthetists I	1
NRSZ 601	Laboratory in Principles and Practice of Nurse Anesthesia I	1
PHIS 501	Mammalian Physiology	5
PHTX 515	Pharmacology for Nurse Anesthetists I	3
	Term Hours:	13
Spring semester		
MEDC 532	Medicinal Chemistry for Nurse Anesthetists	3
NRSA 603	Principles and Practice of Nurse Anesthesia III	3
NRSA 621	Advanced Health Assessment for Nurse Anesthetists II	1
NRSA 622	Clinical Practicum I-II	1
NRSA 683	Research Methods in Nurse Anesthesia Practice	3
PHTX 516	Pharmacology for Nurse Anesthetists II	3
	Term Hours:	14
Summer semester		
NRSA 602	Principles and Practice of Nurse Anesthesia II	3
NRSA 623	Clinical Practicum I-II	3
NRSA 633	Pathophysiology for Nurse Anesthetists	3
NRSA 642	Professional Aspects of Anesthesia Practice I	1
	Term Hours:	10
Year two		
Fall semester		
ALHP 708	Ethics and Health Care	3
NRSA 604	Principles and Practice of Nurse Anesthesia IV	2
NRSA 624	Clinical Practicum III	6

NRSA 645	Professional Aspects of Anesthesia Practice II	1
	Term Hours:	12
Spring semester		
DNAP 703	Health Services Delivery Systems for the Nurse Anesthetist	3
NRSA 605	Principles and Practice of Nurse Anesthesia V	2
NRSA 625	Clinical Practicum IV	6
NRSA 647	Professional Aspects of Anesthesia Practice III	1
	Term Hours:	12
Summer semester		
DNAP 712	Leadership in Nurse Anesthesia Education	3
NRSA 626	Clinical Practicum V	6
NRSA 684	Evidence-based Decision Making in Nurse Anesthesia	3
	Term Hours:	12
Year three		
Fall semester		
ALHP 760	Biostatistical Methods for Health Related Sciences	3
DNAP 701	Human Factors and Patient Safety for Nurse Anesthetists (crosslisted as NRSA 701)	3
DNAP 789	Nurse Anesthesia Professional Practice	6
M.S.N.A. awarded		
	Term Hours:	12
Spring semester		
DNAP 702	Nurse Anesthesia Patient Safety Seminar	3
DNAP 711	Policy and Practice for Nurse Anesthetists	3
DNAP 799	Nurse Anesthesia Capstone Project	6
D.N.A.P. awarded		
	Term Hours:	12
	Total Hours:	97

[1]Completing NRSA 611, an elective, results in 14 semester hours and 98 total hours.

Graduate program director
Michael D. Fallacaro, D.N.S., CRNA, FAAN
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Additional contact
Suzanne M. Wright, Ph.D., CRNA
Associate professor and assistant program director
Email: smwright@vcu.edu
Phone: (804) 828-9808

Program website: sahp.vcu.edu/nrsa (http://www.sahp.vcu.edu/nrsa)

Nurse Anesthesia, Master of Science in (M.S.N.A.)

Program accreditation

Council on Accreditation of Nurse Anesthesia Educational Programs

Note: Admission to this program is temporarily suspended.

Program goal

The mission of the Department of Nurse Anesthesia is to provide learners with the knowledge and skills necessary to work as part of an interprofessional team to serve the public through the delivery of safe, cost-efficient, quality anesthesia services and to develop leaders and scholars who will advance the specialty of nurse anesthesia through research, scholarship and public service. The department achieves this mission by establishing an environment that promotes excellence, values diversity, stimulates creativity and recognizes achievement.

Student learning outcomes

The overall objective of the Master of Science in Nurse Anesthesia degree program is to prepare graduates who have acquired knowledge, skills and competencies in patient safety, perianesthetic management, critical thinking and communication to fulfill their professional responsibility as certified nurse anesthetists.

Upon completion of the program, the graduate will:

1. Plan, organize, deliver and evaluate safe anesthesia care
2. Design, implement and evaluate perianesthetic care
3. Incorporate critical thinking into ongoing professional practice
4. Evaluate the postoperative course of a patient
5. Assimilate into practice effective and culturally competent written, verbal and nonverbal communication with patients and families, other individuals involved in patient care, and the public
6. Assume responsibility for professional behavior

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

A student handbook will be made available to all admitted students in their cohort organizations in Blackboard.

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.N.A.	Fall only	Oct 1	GRE within five years of application

Note: Review of applications is ongoing. Preference is given to applications received prior to Jan. 1 for fall entry.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. Baccalaureate degree in nursing or related science
2. Current licensure as a registered professional nurse in Virginia (by completion of the first semester)
3. Cumulative minimum undergraduate grade point average of 3.0 on a 4.0 scale (preferred)
4. Upper-division undergraduate organic chemistry course or a Web-based medicinal chemistry prep course offered through VCU's Department of Chemistry [Contact (804) 828-9808 to register.]
5. A minimum of one year's experience in an area of acute/critical care nursing (recent)
6. Personal interview with members of the admissions committee (by invitation)
7. Three professional references (One must be from the immediate supervisor who is responsible for applicant's performance evaluations with contact phone number attached.)

Contact the department (804) 828-9808 for specific admission requirements.

Note: Admission to this program is temporarily suspended.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), candidates for the M.S.N.A. degree must be recommended by the faculty and:

1. Complete all requirements for the prescribed curriculum
2. Earn a minimum GPA of 3.0 in all NRSA courses
3. Earn a minimum cumulative GPA of 3.0 in all work presented for graduation
4. Meet all clinical requirements as specified by the National Board on Certification and Recertification of Nurse Anesthetists
5. Successfully complete the Self Evaluation Examination offered by the National Board of Certification and Recertification for Nurse Anesthetists and a two-part (didactic/research) written comprehensive examination

Curriculum requirements

Course	Title	Hours
MEDC 532	Medicinal Chemistry for Nurse Anesthetists	3
NRSA 601	Principles and Practice of Nurse Anesthesia I	3
NRSA 602	Principles and Practice of Nurse Anesthesia II	3
NRSA 603	Principles and Practice of Nurse Anesthesia III	3
NRSA 604	Principles and Practice of Nurse Anesthesia IV	2
NRSA 605	Principles and Practice of Nurse Anesthesia V	2
NRSA 620	Advanced Health Assessment for Nurse Anesthetists I	1
NRSA 621	Advanced Health Assessment for Nurse Anesthetists II	1
NRSA 622	Clinical Practicum I-II	1
NRSA 623	Clinical Practicum I-II	3
NRSA 624	Clinical Practicum III	6
NRSA 625	Clinical Practicum IV	6
NRSA 626	Clinical Practicum V	6
NRSA 627	Clinical Practicum VI	6
NRSA 633	Pathophysiology for Nurse Anesthetists	3
NRSA 642	Professional Aspects of Anesthesia Practice I	1

NRSA 645	Professional Aspects of Anesthesia Practice II	1
NRSA 647	Professional Aspects of Anesthesia Practice III	1
NRSA 683	Research Methods in Nurse Anesthesia Practice	3
NRSA 684	Evidence-based Decision Making in Nurse Anesthesia	3
NRSA/DNAP 701	Human Factors and Patient Safety for Nurse Anesthetists	3
NRSZ 601	Laboratory in Principles and Practice of Nurse Anesthesia I	1
PHIS 501	Mammalian Physiology	5
PHTX 515	Pharmacology for Nurse Anesthetists I	3
PHTX 516	Pharmacology for Nurse Anesthetists II	3
Total Hours		73

Total graduate credit hours required (minimum) 73

Sample plan of study

Year one

Fall semester		**Hours**
NRSA 601	Principles and Practice of Nurse Anesthesia I	3
NRSA 620	Advanced Health Assessment for Nurse Anesthetists I	1
NRSZ 601	Laboratory in Principles and Practice of Nurse Anesthesia I	1
PHIS 501	Mammalian Physiology	5
PHTX 515	Pharmacology for Nurse Anesthetists I	3
	Term Hours:	13
Spring semester		
MEDC 532	Medicinal Chemistry for Nurse Anesthetists	3
NRSA 603	Principles and Practice of Nurse Anesthesia III	3
NRSA 621	Advanced Health Assessment for Nurse Anesthetists II	1
NRSA 622	Clinical Practicum I-II	1
NRSA 683	Research Methods in Nurse Anesthesia Practice	3
PHTX 516	Pharmacology for Nurse Anesthetists II	3
	Term Hours:	14
Summer semester		
NRSA 602	Principles and Practice of Nurse Anesthesia II	3
NRSA 623	Clinical Practicum I-II	3
NRSA 633	Pathophysiology for Nurse Anesthetists	3
NRSA 642	Professional Aspects of Anesthesia Practice I	1
	Term Hours:	10

Year two

Fall semester		
NRSA 604	Principles and Practice of Nurse Anesthesia IV	2
NRSA 624	Clinical Practicum III	6
NRSA 645	Professional Aspects of Anesthesia Practice II	1
	Term Hours:	9
Spring semester		
NRSA 605	Principles and Practice of Nurse Anesthesia V	2
NRSA 625	Clinical Practicum IV	6
NRSA 647	Professional Aspects of Anesthesia Practice III	1
	Term Hours:	9
Summer semester		
NRSA 626	Clinical Practicum V	6
NRSA 684	Evidence-based Decision Making in Nurse Anesthesia	3
	Term Hours:	9

Year three

Fall semester		
NRSA 627	Clinical Practicum VI	6
NRSA 701	Human Factors and Patient Safety for Nurse Anesthetists (crosslisted as DNAP 701)	3
	Term Hours:	9
	Total Hours:	73

Graduate program director
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Associate professor and assistant program director
Email: smwright@vcu.edu
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Program website: sahp.vcu.edu/nrsa (http://www.sahp.vcu.edu/nrsa)

Department of Occupational Therapy

Albert E. Copolillo, Ph.D.
Associate professor and chair

The program in occupational therapy was initiated at Richmond Professional Institute in 1942. In 1965, the graduate program leading to a Master of Science degree in basic professional education in occupational therapy was initiated. The School of Occupational Therapy became a department in the then-School of Allied Health Professions in 1970.

Philosophy

The philosophy of the Department of Occupational Therapy embraces the philosophical base of occupational therapy stated by the American Occupational Therapy Association (1979):

> Man is an active being whose development is influenced by the use of purposeful activity. Human beings are able to influence their physical and mental health and their social and physical environment through purposeful activity. Human life is a process of continuous adaptation. Adaptation is a change in function that promotes survival and self-

actualization. Biological, psychological and environmental factors may interrupt the adaptation process at any time throughout the life cycle, causing dysfunction. Purposeful activity facilitates the adaptive process. Purposeful activity (occupation), including its interpersonal and environmental components, may be used to prevent and mediate dysfunction and to elicit maximum function. Activity as used by occupational therapists includes both an intrinsic and a therapeutic purpose. (AOTA. [1979]. The philosophical base of occupational therapy. AJOT, 33, 785.)

Mission

The primary mission of the Department of Occupational Therapy is the preparation of excellent, innovative, adaptable and responsible occupational therapists as professional leaders for the state and the nation.

In pursuit of this mission, the department:

- Fosters student commitment to scientific inquiry and professional competence, and promotes personal growth, balance and dedication to lifelong learning
- Promotes faculty excellence and collaboration in teaching, scholarship and research that models integrity and competence
- Collaborates with the community through education, consultation and the development of strong linkages with clinical educators and the community
- Interacts dynamically with the occupational therapy profession and stakeholders, contributing proactively to the evolution of the profession

Facilities

The educational facilities of the Department of Occupational Therapy are located in the Theater Row building at 730 E. Broad St. During the professional master's degree program, fieldwork assignments are made for students in a wide range of clinics and agencies in the Richmond metropolitan area. A 24-week extended fieldwork requirement will be arranged in approved clinical education facilities throughout the United States.

Academic regulations

Students are admitted to the occupational therapy programs with the expectation that they will direct maximum time and effort to the learning process. Outside activities must be scheduled by students for such dates and hours as permit full compliance with the time requirements for course work. Tardiness, lack of regular attendance or failure to meet deadlines for course assignments will not be excused because of employment or other outside activities.

To continue in the graduate curriculum, students are expected to maintain a cumulative GPA of 3.0 based on course work following matriculation.

- Graduate students who fail to maintain a 3.0 cumulative GPA or receive a grade of D (regardless of the cumulative GPA) will automatically be placed on probation and will be notified of probationary status.
- Conditions of probation:
  - Students must earn a quality point average during the semester of probation sufficient to result in a cumulative GPA of 3.0 in order to be removed from probationary status.
  - Students who are on probation due to receiving a D grade must retake that course, achieving a grade of C or better while also meeting all other academic standards.
  - Conditions of probation also may include recommendations for academic counseling, assignments by individual instructors and other requirements identified by the Committee on Academic Standing and Student Progress. Conditions of probation will be detailed in a letter of notification of probation prepared by this committee.
  - Only one semester of academic probation is permitted in the program. If probationary students fail to meet academic standards (GPA of 3.0) in a second semester or do not successfully complete deficient courses, they will be considered for dismissal.
- As courses usually are offered only once a year and because early courses serve as prerequisites for later courses, students retaking a course or taking a reduced course load will have to continue under an adjusted curriculum plan. This will result in extending the student's time in the program.
- Students who receive an F grade in any required course will be considered for dismissal by the committee.
- University standards require that a graduate student must not have more than six semester hours or 20 percent of semester hours attempted, whichever is greater, with a grade of C. Students who receive a grade of C on more than the allowable number of semester hours will be reviewed for possible academic termination by the Committee on Academic Standing and Student Progress. Students who are not terminated for this criterion will be placed on automatic probation.
- If a student withdraws or is terminated by the clinical faculty before the completion of the Level II fieldwork course, the student will receive an U grade for the course.
  If the student withdraws, is terminated or fails a fieldwork experience, the course may be repeated only upon approval by the Committee on Academic Standing and Student Progress in consultation with the department chair and the fieldwork coordinator. Students may be dismissed from the program or be allowed to continue contingent upon fulfilling remedial activities based on a plan prepared by the fieldwork coordinator and ratified by the committee. No more than one additional fieldwork experience will be rescheduled.
  The opportunity to re-register and repeat the fieldwork course is contingent upon the fieldwork coordinator's ability to locate another facility willing to offer a fieldwork experience to the student and upon the support of the committee. Level II fieldwork must be completed no later than 24 months subsequent to the completion of the academic phase.
- To continue in good standing, students also are expected to:
  - Pay all fees
  - Maintain personal attributes and ethical behaviors consistent with professional practice as defined in the Occupational Therapy Department Student Handbook
  - Complete fieldwork requirements to the satisfaction of clinical and academic faculty
- Although arrangements are made in advance, each student is reviewed prior to placement in the Level II Fieldwork education. Students must have satisfactorily completed courses prerequisite to that fieldwork experience and be recommended by the faculty. They must demonstrate professional behavior as specified in the ethical behaviors listed in the Occupational Therapy Department

Student Handbook. Medical problems may delay or prevent fieldwork placement.

- Occupational Therapy Doctorate (O.T.D.), entry-level (p. 178)
- Occupational Therapy Doctorate (O.T.D.), post-professional (p. 181)
- Occupational Therapy, Master of Science in (M.S.O.T.) (p. 184)
- Occupational Therapy, Master of Science in (M.S.O.T.)/Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined] (p. 187)

Occupational Therapy Doctorate (O.T.D.), entry-level

Program accreditation
Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association

The O.T.D. program prepares students for entry-level practice while also providing advanced training in evidence-based practice, interprofessional and collaborative care and program and career development. In April 2014, the Board of Directors of the American Occupational Therapy Association, responding to changes seen in higher education, health care and the profession, issued a statement in support of a doctoral-level single point of entry for occupational therapists. The recommended target date for completion of the transition is 2025. The Board's rationale included:

- Greater demands for practice-based scholarship and research
- A need to prepare graduates with professional autonomy and avoid de-professionalization
- An increased focus on primary care, interprofessional care teams and specialization in practice
- Trends in health care professions to transition to the entry-level doctorate
- Creation of an unambiguous entry level that reflects equivalent preparation of all practitioners entering the profession

The entry-level O.T.D. program is designed to prepare students for careers in a wide range of occupational therapy practice settings. Graduates will be eligible to apply for licensure to practice in any state.

Program goal

The primary mission of the Department of Occupational Therapy is the preparation of excellent, innovative, adaptable and responsible occupational therapists as professional leaders for the state, the nation and the world. Our mission represents an integration of the missions of the university and the College of Health Professions. In pursuit of this mission, the department:

- Fosters student commitment to scientific inquiry and professional competence and promotes growth, balance and dedication to lifelong learning
- Promotes faculty excellence and collaboration in teaching, scholarship, research and service that models integrity and competence
- Collaborates with the community through education, consultation and the development of strong linkages with clinical educators and the community
- Interacts dynamically with the OT profession and stakeholders, contributing proactively to the evolution of the profession.

Student learning outcomes

1. **Meet foundational requirements:** As part of a broad foundation in liberal arts and sciences, including biological, physical, social and behavioral sciences, to meet the needs of individuals and communities, students will be able to employ logical thinking, critical analysis, clinical reasoning and problem-solving to demonstrate oral and written communication skills, innovative use of computer technology, knowledge of human structure and function, awareness of social development and apply the use of statistics to interpret tests and measurements. (Objectives B.1.1-B.1.11 in ACOTE Standards)
2. **Basic tenets of occupational therapy:** Students will be able to explain the meaning and impact of occupation in meeting society's current and future occupational needs, including articulating the historical and philosophical base of the profession, its role as a central construct in OT theory development, its relationship to the promotion of health and wellness and prevention of disease and disability. Recognizing the importance of activity analysis in the process of formulating intervention plans will be an emphasis for student learning. (Objectives B.2.1-B.2.11 in ACOTE Standards)
3. **OT theories, models and frames of reference:** Students will be able to describe, integrate and apply a variety of occupational therapy theories, models of practice and frames of reference in evaluation and intervention and will articulate the process of theory development and its desired impact and influence on the individual and society. Students will be able to discuss how practice influences and is influenced by history, theory and sociopolitical climate. Occupational therapy theories and models covered in the curriculum will include but not be limited to: the model of human occupation, sensory integration, biomechanical and rehabilitation models, motor control and movement recovery models. (Objectives B.3.1-B.3.6 in ACOTE Standards)
4. **OT screening, evaluation and referral:** To analyze, synthesize, evaluate and diagnose problems related to occupational performance and participation, students will be able to use evidence-based reasoning to select appropriate tools, both standardized and non-standardized; analyze psychometric properties of assessment tools; evaluate occupational performance across all areas of occupation; distinguish between roles of occupational therapists and occupational therapy assistants; make appropriate client referrals; interpret test results; and document services to assure accountability, reimbursement and need for services. (Objectives B.4.1-B.4.11 in ACOTE Standards)
5. **Intervention planning:** In accordance with the Occupational Therapy Practice Framework, students will learn to develop occupation-based intervention plans and strategies from the level of individual to population-based interventions in traditional and emerging practice environments. Intervention planning will be based on appropriate theoretical approaches, information acquired via occupational profiles, evaluation of client factors — body function and structure strengths/weaknesses, performance patterns, contextual issues, activity demands, and performance skills. Students will be able to choose appropriate therapeutic activities, learn the value of therapeutic use of self, modify environments, incorporate assistive technologies, fabricate needed orthotics and train clients in areas of mobility and transfer, feeding and eating, and activities of daily living. Students will educate clients as needed and safely use superficial thermal and mechanical modalities as preparatory measures to

improving occupational performance. (Objectives B.5.1-B.5.28 in ACOTE Standards)

6. **Context of service delivery:** Students will demonstrate knowledge of the variety of contexts that affect and are affected by occupational therapy service delivery. They will be able to compare and contrast differences in service delivery systems, including health care, education, community and social systems. They will be able to discuss the impact of socioeconomic and political influences on occupational therapy and advocate for changes in policies and systems to address society's occupational needs. They will integrate national and international resources in education, research, practice and policy development. (Objectives B.6.1-B.6.6 in ACOTE Standards)
7. **Leadership and management:** Students will be able to identify and evaluate how contextual factors affect service delivery and management of services; awareness of how federal and state laws guide service delivery; understanding of the requirements for licensing and certification, documentation and reimbursement; and the essential nature of competency-based procedures for legal and ethical supervision of occupational therapy personnel, non-occupational therapy personnel and fieldwork students. Students will demonstrate the ability to design and write program development plans for the provision of occupational therapy services to individuals and populations. (Objectives B.7.1-B.7.12 in ACOTE Standards)
8. **Scholarship:** Students will be able to articulate the importance of knowledge development for the profession; locate, critique and interpret research evidence; apply research literature to make evidence-based practice decisions; use and interpret basic descriptive, correlational and inferential quantitative statistics and code; analyze and synthesize qualitative data; and demonstrate an understanding of the grant process. Students will complete a culminating project that involves the design of a scholarly proposal, implementation and documentation of the study. (Objectives B.8.1-B.8.10 in ACOTE Standards)
9. **Professional ethics, values and responsibilities:** Students will be able to demonstrate knowledge and understanding of the American OT Association Code of Ethics and Ethics Standards and AOTA Standards of Practice; the importance of membership in professional organizations; the value of supporting and educating other professions about OT; identification and development of strategies for ongoing professional development; responsibilities related to liability; conflict resolution; contractual service provision; and ethical supervision. Students will discuss and justify the varied roles of occupational therapists, including program and policy development, advocate, administrator and leader. (Objectives B.9.1-B.9.13 in ACOTE Standards)
10. **Fieldwork:** Through a carefully coordinated process of fieldwork, students will be able to apply concepts learned in the classroom to practice settings under careful supervision of trained and qualified occupational therapy practitioners. Gradation of time spent, responsibilities and expectations placed on students will be provided through assignment, first to fieldwork level I and then to fieldwork level II experiences across a wide range of settings and practice areas. (Objectives C.1.1-C.1.19 in ACOTE Standards)
11. **Doctoral experiential component:** Through completion of a professional portfolio, a doctoral experiential component, and evaluation and dissemination, students will demonstrate leadership and advanced skills in one or more of the following areas: clinical practice, administration, research, program or policy development, advocacy, education or theory development. Upon completion of all course work, fieldwork and doctoral experiential requirements, students will be prepared to take the National Board for Certification in Occupational Therapy examination, thereby qualifying them for state licensure and practice of occupational therapy at the entry level. (Objectives C.2.1-2.5 in ACOTE Standards)

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

All graduates of an occupational therapy program are required to take the national certification examination to become a registered occupational therapist and use the credentials OTR. The national certifying organization for occupational therapy is the National Board

for Certification in Occupational Therapy. Other licensure or certification requirements have been established by all 50 states, the District of Columbia, Guam and Puerto Rico. Most licensure requirements include board certification as a registered occupational therapist. Some licensure or certification agencies consider individuals convicted of a felony ineligible for licensure or certification. For specific information, prospective students should contact the licensure or certification agency for occupational therapy.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
O.T.D.	Summer	Dec 1 (OTCAS and VCU graduate applications)	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. A bachelor's degree from an accredited college or university
2. A minimum grade-point average in all college courses of 2.7 (based on a 4.0 system)
3. A minimum grade-point average in prerequisite courses of 3.0. (without rounding)
4. A one-page, "value-added" essay submitted as a PDF file to otentrylevel@vcu.edu
5. An Occupational Therapy Centralized Application Service application (https://portal.otcas.org) including these items:
   a. A personal statement that addresses:
      i Why applicant is selecting OT as a career
      ii How a master's degree in OT relates to immediate and long-term professional goals
      iii How the applicant's personal, educational and professional background will help achieve these goals
   b. Evidence of completion of a minimum of 30 observation hours in one or more settings under the supervision of a licensed OTR or COTA
   c. Three letters of recommendation (One letter from an occupational therapist is preferred, but it is not essential.)
   d. Ten prerequisite (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd/prerequisite-courses) courses (30-32 semester credit hours)
6. A course on medical terminology (strongly recommended, but not required)
7. For non-native English-speaking applicants, regardless of immigration status, a Test of English as a Foreign Language iBT score of greater than 102, a TOEFL CBT score of greater than 253, a TOEFL PBT score of greater than 610 or an International English Language Testing System score of greater than 6.5

The VCU entry-level occupational therapy doctorate is a 104 credit program that spans three years (nine semesters). Applicants apply for the program between July and Dec. 1 of the year preceding enrollment. Orientation and summer semester classes begin the first week of June. The first semester is a seven-credit part-time semester and the second summer semester is a five-credit part-time semester. All other semesters, including the last year of two semesters of Level II fieldwork and the final semester of doctoral practicum are full-time semesters. Five courses in the curriculum (OCCT 780, OCCT 781, OCCT 782, OCCT 783 and OCCT 784) taken during the second summer and the second and third spring semesters will be taught in a hybrid format, which will require some on-campus hours with the remainder taught using the Blackboard course management system. Students will be required to have a computer or tablet with access to the Internet.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete all College of Health Professions requirements and successfully complete 104 credit hours.

Course	Title	Hours
IPEC 501	Foundations of Interprofessional Practice	1
OCCT 580	Introduction to the Profession of Occupational Therapy	2
OCCT 589	Advanced Functional Anatomy	5
OCCT 590	Functional Movement Analysis in Occupational Therapy	3
OCCT 591	Neuroscience Applications to Occupational Therapy	4
OCCT 592	Introduction to Injury, Illness and Disability	3
OCCT 593	Analysis of Human Occupation	1
OCCT 594	Theoretical Foundations of Occupational Therapy	4
OCCT 613	Adult Occupational Performance I	3
OCCT 614	Pediatric Occupational Performance I	4
OCCT 615	Level I Fieldwork in Occupational Therapy	1
OCCT 616	Research Process in Occupational Therapy	3
OCCT 617	Therapeutic Process in Occupational Therapy	3
OCCT 689	Occupational Therapy Assessment and Evaluation	3
OCCT 692	Assistive Technologies for Occupational Engagement	2
OCCT 693	Occupational Synthesis and Adaptations	2
OCCT 713	Adult Occupational Performance II	4
OCCT 714	Pediatric Occupational Performance II	4
OCCT 715	Level I Fieldwork in Occupational Therapy	1
OCCT 716	Evidence-based Practice in Occupational Therapy	3
OCCT 717	Level I Fieldwork in Psychosocial Occupational Therapy	3
OCCT 720	Policy, Advocacy and Management for Occupational Therapy Practice	3
OCCT 721	Clinical Reasoning in Occupational Therapy	3
OCCT 759	Fieldwork Education Seminar	2

OCCT 760	Level II Fieldwork in Occupational Therapy	9
OCCT 761	Level II Fieldwork in Occupational Therapy	9
OCCT 780	OTD Leadership Seminar	2
OCCT 782	Professional Development Portfolio	2
OCCT 781	Program Development and Evaluation	3
OCCT 783	Doctoral Practicum	10
OCCT 784	Practicum Evaluation and Dissemination	2
Total Hours		104

Total graduate credit hours required (minimum) 104

Sample plan of study

Year one

Summer semester		**Hours**
OCCT 580	Introduction to the Profession of Occupational Therapy	2
OCCT 589	Advanced Functional Anatomy	5
	Term Hours:	7
Fall		
IPEC 501	Foundations of Interprofessional Practice	1
OCCT 590	Functional Movement Analysis in Occupational Therapy	3
OCCT 591	Neuroscience Applications to Occupational Therapy	4
OCCT 592	Introduction to Injury, Illness and Disability	3
OCCT 593	Analysis of Human Occupation	1
OCCT 594	Theoretical Foundations of Occupational Therapy	4
	Term Hours:	16
Spring		
OCCT 613	Adult Occupational Performance I	3
OCCT 614	Pediatric Occupational Performance I	4
OCCT 615	Level I Fieldwork in Occupational Therapy	1
OCCT 616	Research Process in Occupational Therapy	3
OCCT 617	Therapeutic Process in Occupational Therapy	3
OCCT 689	Occupational Therapy Assessment and Evaluation	3
	Term Hours:	17

Year two

Summer semester		
OCCT 780	OTD Leadership Seminar	2
OCCT 781	Program Development and Evaluation	3
	Term Hours:	5
Fall semester		
OCCT 692	Assistive Technologies for Occupational Engagement	2
OCCT 713	Adult Occupational Performance II	4
OCCT 714	Pediatric Occupational Performance II	4
OCCT 715	Level I Fieldwork in Occupational Therapy	1
OCCT 716	Evidence-based Practice in Occupational Therapy	3
	Term Hours:	14
Spring semester		
OCCT 693	Occupational Synthesis and Adaptations	2
OCCT 717	Level I Fieldwork in Psychosocial Occupational Therapy	3
OCCT 720	Policy, Advocacy and Management for Occupational Therapy Practice	3
OCCT 721	Clinical Reasoning in Occupational Therapy	3
OCCT 759	Fieldwork Education Seminar	2
OCCT 782	Professional Development Portfolio	2
	Term Hours:	15

Year three

Summer semester		
OCCT 760	Level II Fieldwork in Occupational Therapy	9
	Term Hours:	9
Fall semester		
OCCT 761	Level II Fieldwork in Occupational Therapy	9
	Term Hours:	9
Spring semester		
OCCT 783	Doctoral Practicum	10
OCCT 784	Practicum Evaluation and Dissemination	2
	Term Hours:	12
	Total Hours:	104

Graduate program director
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Program website: sahp.vcu.edu/departments/occu/programs/entry-level-otd (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd)

Occupational Therapy Doctorate (O.T.D.), post-professional

Note: As part of the transition from the entry-level program from the M.S.O.T. to the O.T.D. degree, the Department of Occupational Therapy has suspended admissions to the post-professional O.T.D. until summer 2016. The post-professional O.T.D. curriculum is being adjusted to bring that program in synch with the entry-level O.T.D. The department's goal is to provide the best overall program at both levels. Plans continue to evolve, so please be in touch if you are interested in a post-professional

O.T.D. Prospective students can visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/postprofessional-otd) or call directly at (804) 828-2220.

Program goal

The primary mission of the Department of Occupational Therapy is the preparation of excellent, innovative, adaptable and responsible occupational therapists as professional leaders for the state, the nation and the world. Our mission represents an integration of the missions of the university and the College of Health Professions. In pursuit of this mission, the department:

1. Prepares students to become client-centered practitioners who utilize up-to-date evidence, theory and technology to facilitate their clients' health and well-being through the use of occupation
2. Seeds the development of new occupational therapy leaders in research, teaching and service through educational, community and research expectations and opportunities
3. Fosters student commitment to scientific inquiry and professional competence and promotes personal growth, balance and dedication to lifelong learning and service
4. Promotes faculty excellence, collaboration and leadership in teaching, scholarship, research and service that models integrity, competence and evidence-based practice
5. Collaborates with the community through education, consultation and the development of strong linkages with practitioners, clinical educators and the community
6. Interacts dynamically with the OT profession and stakeholders, contributing proactively to the evolution and recognition of the profession and the use of occupation to meet society's needs for health and quality life

Student learning outcomes

1. The student will articulate knowledge of leadership theories and models, critically analyze current leadership abilities and apply leadership skill in professional contexts.
2. The student will identify and use professional, data-driven evidence to support professional programs and initiatives through proposal writing for grant funding and program development.
3. The student will demonstrate advanced skill in developing and implementing new programs/projects designed to advance the field of occupational therapy.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student manuals are distributed to new students every August at the on-campus meeting.

Note: As part of the transition from the entry-level program from the M.S.O.T. to the O.T.D. degree, the Department of Occupational Therapy has suspended admissions to the post-professional O.T.D. until summer 2016. The post-professional O.T.D. curriculum is being adjusted to bring that program in synch with the entry-level O.T.D. The department's goal is to provide the best overall program at both levels. Plans continue to evolve, so please be in touch if you are interested in a post-professional O.T.D. Prospective students can visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/postprofessional-otd) or call directly at (804) 828-2220.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
O.T.D.	Fall	May 1	GRE (if applying with a bachelor's degree in occupational therapy)

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum acceptable standards for admission:

1. Bachelor's or master's degree in occupational therapy from an accredited college or university
2. Cumulative minimum GPA of 3.0 from prior course work
3. Current (within 5 years) GRE scores if applying with a bachelor's degree (The GRE is not required if applying with a master's degree.)
4. Official transcripts in sealed envelopes and signed by university official across seal
5. A leadership essay describing how earning an O.T.D. and completing a capstone leadership project will enhance personal career goals and how the applicant may use advanced leadership skills developed in this program to advance the profession of occupational therapy
6. Curriculum vitae or resume that details professional leadership experience
7. Three letters of recommendation

Note: As part of the transition from the entry-level program from the M.S.O.T. to the O.T.D. degree, the Department of Occupational Therapy has suspended admissions to the post-professional O.T.D. until summer 2016. The post-professional O.T.D. curriculum is being adjusted to bring that program in synch with the entry-level O.T.D. The department's goal is to provide the best overall program at both levels. Plans continue to evolve, so please be in touch if you are interested in a post-professional O.T.D. Prospective students can visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/postprofessional-otd) or call directly at (804) 828-2220.

Degree requirements

The Occupational Therapy Doctorate is a part-time, distance education, post-professional program for students with an occupational therapy degree. It combines Web-based instruction with on-campus meetings twice a year, in August and January. The program follows the traditional fall and spring semester schedule. Summer courses are required for students entering with a bachelor's degree and are optional for students entering with a master's degree. The curriculum consists of leadership, research/scientific foundation and theory practice foundation core courses, along with electives for concentrated study.

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete all university and College of Health Professions requirements. Students must successfully complete all credit hours appropriate to the curriculum into which students enter. The curriculum for an occupational therapist entering with a master's degree from VCU requires a minimum of 21 credit hours. The curriculum for an occupational therapist entering with a master's degree from another university or college requires a minimum of 32 credit hours. The curriculum for an occupational therapist entering with a baccalaureate degree requires a minimum of 47 credit hours of courses.

Curriculum requirements

Students entering with an M.S. from VCU

Course	Title	Hours
Research and scientific foundations core		
OCCT 735	Evidence Bases for Occupational Therapy Practice	3
Leadership core		
OCCT 736	Developing Fundable Projects	3
OCCT 739	Program Development and Evaluation	3
OCCT 740	Concepts in Disability Leadership for Occupational Therapists	3
OCCT 741	Leadership Applications for Occupational Therapists	3
OCCT 742	Practicum in Leadership for Occupational Therapists	4
OCCT 743	Synthesis and Evaluation of Capstone Leadership Project	2
Total Hours		21

Total graduate credit hours required (minimum) 21

Students entering with an M.S. from another university/college

Course	Title	Hours
OCCT 671	Advanced Theory in Occupational Therapy	4
OCCT 673	Health Care Delivery and Occupational Therapy Practice Models	3
OCCT 710	Quantitative Research Processes	4
OCCT 735	Evidence Bases for Occupational Therapy Practice	3
OCCT 736	Developing Fundable Projects	3
OCCT 739	Program Development and Evaluation	3
OCCT 740	Concepts in Disability Leadership for Occupational Therapists	3
OCCT 741	Leadership Applications for Occupational Therapists	3
OCCT 742	Practicum in Leadership for Occupational Therapists	4
OCCT 743	Synthesis and Evaluation of Capstone Leadership Project	2
Total Hours		32

Total graduate credit hours required (minimum) 32

Students entering with a B.S.

Course	Title	Hours
OCCT 671	Advanced Theory in Occupational Therapy	4
OCCT 673	Health Care Delivery and Occupational Therapy Practice Models	3
OCCT 685	Advanced Clinical Reasoning: Asking the Right Questions	3
OCCT 686	Advanced Clinical Reasoning Applications	3
OCCT 710	Quantitative Research Processes	4
OCCT 735	Evidence Bases for Occupational Therapy Practice	3
OCCT 736	Developing Fundable Projects	3
OCCT 739	Program Development and Evaluation	3
OCCT 740	Concepts in Disability Leadership for Occupational Therapists	3
OCCT 741	Leadership Applications for Occupational Therapists	3
OCCT 742	Practicum in Leadership for Occupational Therapists	4

OCCT 743	Synthesis and Evaluation of Capstone Leadership Project	2
Electives		
Select three of the following: [1]		9
GRTY 510	Aging	
GRTY 604	Problems, Issues and Trends in Gerontology	
GRTY 606	Aging and Human Values	
OCCT 690	Occupational Therapy Seminar	
OCCT 697	Independent Study	
SEDP 532	Understanding Autism Spectrum Disorder	
SEDP 634	Assessment, Curriculum and Teaching Methods for Autism Spectrum Disorder	
SEDP 635	Supporting Behavior and Social Skills for Autism Spectrum Disorder	
SEDP 638	Instructional Design and Field Experience for Autism Spectrum Disorder	
Total Hours		47

[1]

Electives must be at the graduate level, consistent with the student's overall leadership direction and approved by the director of post-professional education. They may be taken at VCU or at another university or college. Some options at VCU include those listed below. Please check Online@VCU for additional opportunities.

Total graduate credit hours required (minimum) 47

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Phone: (804) 828-2219

Program website: sahp.vcu.edu/departments/occu/programs/postprofessional-otd (http://www.sahp.vcu.edu/departments/occu/programs/postprofessional-otd)

Occupational Therapy, Master of Science in (M.S.O.T.)

Program accreditation
Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association

Note: Starting summer 2016, the M.S.O.T. program will be replaced with an entry-level occupational therapy doctorate, or O.T.D. The last class of M.S.O.T. students, enrolled in summer 2015, will graduate in December 2017. Students with a bachelor's degree who meet all prerequisite requirements may apply to the entry-level OTD program from mid-July to December of 2015 and yearly thereon. Prospective students may visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd) for details on the entry-level O.T.D.

Program goal

The primary mission of the Department of Occupational Therapy is the preparation of excellent, innovative, adaptable and responsible occupational therapists as professional leaders for the state, the nation and the world. Our mission represents an integration of the missions of the university and the College of Health Professions. In pursuit of this mission, the department:

1. Prepares students to become client-centered practitioners who utilize up-to-date evidence, theory and technology to facilitate their clients' health and well-being through the use of occupation
2. Seeds the development of new occupational therapy leaders in research, teaching and service through educational, community and research expectations and opportunities
3. Fosters student commitment to scientific inquiry and professional competence and promotes personal growth, balance and dedication to lifelong learning and service
4. Promotes faculty excellence, collaboration and leadership in teaching, scholarship, research and service that models integrity, competence and evidence-based practice
5. Collaborates with the community through education, consultation and the development of strong linkages with practitioners, clinical educators and the community
6. Interacts dynamically with the OT profession and stakeholders, contributing proactively to the evolution and recognition of the profession and the use of occupation to meet society's needs for health and quality life

Student learning outcomes

1. **Meet foundational requirements:** As part of a broad foundation in liberal arts and sciences, including biological, physical, social and behavioral sciences, students will be able to employ logical thinking, critical analysis, clinical reasoning and problem solving to demonstrate oral and written communication skills, innovative use of computer technology, knowledge of human structure and function, awareness of social development and use of statistics to interpret tests and measurements. (Objectives B.1.1-B.1.11 in ACOTE Standards)
2. **Basic tenets of occupational therapy:** Students will be able to understand and articulate the meaning and impact of occupation, its historical and philosophical significance to the profession, its role as a central construct in OT theory development, its relationship to the promotion of health and wellness and prevention of disease and disability. Recognizing the importance of activity analysis in the process of formulating intervention plans will be an emphasis for student learning. (Objectives B.2.1-B.2.11 in ACOTE Standards)
3. **OT theories, models and frames of reference:** Students will be able to describe and apply occupational therapy theories and models to these and other theoretical foundations of evaluation and intervention and will demonstrate appreciation for the process of development of theoretical principles. Occupational therapy theories and models covered in the curriculum will include but not be limited to: the model of human occupation sensory integration,

biomechanical and rehabilitation models, motor control and movement recovery models. (Objectives B.3.1-B.3.6 in ACOTE Standards)

4. **OT screening, evaluation and referral:** Students will be able to select appropriate tools, both standardized and nonstandardized, for effective evaluation; analyze psychometric properties of assessment tools; evaluate occupational performance across all areas of occupation; distinguish between roles of occupational therapists and occupational therapy assistants; make appropriate client referrals; interpret test results; and document services to assure accountability, reimbursement and need for services. (Objectives B.4.1-B.4.11 in ACOTE Standards)
5. **Intervention planning:** In accordance with the occupational therapy practice framework, students will learn to develop occupation-based intervention plans and strategies. Intervention planning will be based on information acquired via occupational profiles, evaluation of client factors – body function and structure strengths/weaknesses, performance patterns, contextual issues, activity demands, and performance skills. Students will be able to choose appropriate therapeutic activities, learn the value of therapeutic use of self, modify environments, incorporate assistive technologies, fabricate needed orthotics, and train clients in areas of mobility and transfer, feeding and eating, and activities of daily living. Students will educate clients as needed and safely use superficial thermal and mechanical modalities as preparatory measures to improving occupational performance. (Objectives B.5.1-B.5.28 in ACOTE Standards)
6. **Context of service delivery:** Students will demonstrate knowledge of the variety of contexts that affect and are affected by occupational therapy service delivery. They will be able to compare and contrast differences in service delivery systems, including health care, education, community and social systems. They will be able to discuss the impact of socioeconomic and political influences on occupational therapy and the need to respond to system changes to create opportunities and avoid pitfalls in education, research and practice. (Objectives B.6.1-B.6.6 in ACOTE Standards)
7. **OT management:** Students will be able to describe and demonstrate how practice settings affect service delivery and management of services; awareness of how federal and state laws guide service delivery; understanding of the requirements for licensing and certification, documentation, and reimbursement; and the essential nature of competency-based procedures for legal and ethical supervision of personnel and fieldwork students. Understanding of program needs, service delivery, optional and effective staffing procedures will be discussed. (Objectives B.7.1-B.7.10 in ACOTE Standards)
8. **Understanding and consuming research:** Students will be able to articulate the importance of knowledge development for the profession; locate, critique and interpret research evidence; apply research literature to practice; use basic statistics and qualitative research methods; demonstrate knowledge of the research process; and implement some aspect of research methodology. Discussion of grant writing, proposal development, research dissemination, and translation and research report writing will be included. (Objectives B.8.1-B.8.9 in ACOTE Standards)
9. **Professional ethics:** Students will be able to demonstrate knowledge and understanding of the American OT Association's code of ethics; the importance of membership in professional organizations; the value of supporting and educating other professions about OT; the importance of ongoing professional development; the threat and avoidance of liability issues; conflict resolution; contractual service provision; and ethical supervision. (Objectives B.9.1-B.9.13 in ACOTE Standards)
10. **Fieldwork:** Through a carefully coordinated process of fieldwork, students will be able to apply concepts learned in the classroom to practice settings under careful supervision of trained and qualified occupational therapy practitioners. Gradation of time spent, responsibilities and expectations placed on students will be provided through assignment, first to fieldwork level 1 and then to fieldwork level 2 experiences across a wide range of settings and practice areas. Upon completion of all fieldwork requirements, students will be prepared to take the National Board for Certification in Occupational Therapy examination, thereby qualifying them for state licensure and practice of occupational therapy at the entry level. (Objectives B.10.1-B.1.22 in ACOTE Standards)

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student manual distributed to new students every June during orientation.

All graduates of an occupational therapy program are required to take the national certification examination to become a registered occupational therapist and use the credentials OTR. The national certifying organization for occupational therapy is the National Board for Certification in Occupational Therapy. Other licensure or certification requirements have been established by all 50 states, the District of Columbia, Guam and Puerto Rico. Most licensure requirements include board certification as a registered occupational therapist. Some licensure or certification agencies consider individuals convicted of a felony ineligible for licensure or certification. For specific information, prospective students should contact the licensure or certification agency for occupational therapy.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Note: Starting summer 2016, the M.S.O.T. program will be replaced with an entry-level occupational therapy doctorate, or O.T.D. The last class of M.S.O.T. students, enrolled in summer 2015, will graduate in December 2017. Students with a bachelor's degree who meet all prerequisite requirements may apply to the entry-level OTD program from mid-July to December of 2015 and yearly thereon. Prospective students may visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd) for details on the entry-level O.T.D.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.O.T.	Summer	Dec 1 (OTCAS and VCU graduate applications)	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. A bachelor's degree from an accredited college or university
2. A minimum grade-point average in all college courses of 2.7 (based on a 4.0 system)
3. A minimum grade-point average in prerequisite courses of 3.0. (without rounding)
4. A one-page, "value-added" essay submitted as a PDF file to otentrylevel@vcu.edu
5. An official report of GRE scores to VCU (Institution Code 5570)
6. An Occupational Therapy Centralized Application Service application (https://portal.otcas.org) including these items:
   a. A personal statement that addresses:
      i Why applicant is selecting OT as a career
      ii How a master's degree in OT relates to immediate and long-term professional goals
      iii How the applicant's personal, educational and professional background will help achieve these goals
   b. Evidence of completion of a minimum of 30 observation hours in one or more settings under the supervision of a licensed OTR or COTA
   c. Three letters of recommendation (One letter from an occupational therapist is preferred, but it is not essential.)
   d. Ten prerequisite (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd/prerequisite-courses) courses (30-32 semester credit hours)
7. For non-native English-speaking applicants, regardless of immigration status, a Test of English as a Foreign Language iBT score of greater than 102, a TOEFL CBT score of greater than 253, a TOEFL PBT score of greater than 610 or an International English Language Testing System score of greater than 6.5

Note: Starting summer 2016, the M.S.O.T. program will be replaced with an entry-level occupational therapy doctorate, or O.T.D. The last class of M.S.O.T. students, enrolled in summer 2015, will graduate in December 2017. Students with a bachelor's degree who meet all prerequisite requirements may apply to the entry-level OTD program from mid-July to December of 2015 and yearly thereon. Prospective students may visit the department's website (http://www.sahp.vcu.edu/departments/occu/programs/entry-level-otd) for details on the entry-level O.T.D.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete all College of Health Professions requirements and successfully complete 82 credit hours consisting of 60 credit hours in course work and 22 in fieldwork.

Curriculum requirements

Course	Title	Hours
Courses		
ANAT 525	Advanced Functional Anatomy (Occupational Therapy) (Occupational Therapy)	5
OCCT 520	Occupational Therapy Applications: Kinesiology	2
OCCT 521	Neuroscience Applications to Occupational Therapy	3
OCCT 522	Interdisciplinary Medical Lectures	3
OCCT 530	Nature of Occupational Therapy	2
OCCT 531	Interpersonal Communication and Group Dynamics	2
OCCT 532	Life Span Occupational Development	3
OCCT 533	Occupational Therapy Principles, Values and Theories	4
OCCT 534	Occupational Therapy Evaluation and Intervention Overview	3
OCCT 620	Occupational Therapy Practice Activities I: Activity Analysis	1
OCCT 621	Occupational Therapy Practice Activities II: Assistive Technologies	1
OCCT 623	Occupational Therapy Practice Activities III: Activity and Occupational Synthesis	1

OCCT 630	Adult Evaluation and Intervention I: Foundations	2
OCCT 633	Adult Evaluation and Intervention II: Facilitating Function With Disability Across the Continuum of Care	4
OCCT 635	Psychosocial Evaluation and Intervention I: Foundations	2
OCCT 640	Pediatric Evaluation and Intervention I: Infant and Preschool Children	3
OCCT 641	Pediatric Evaluation and Intervention II: Ages 6 to 12	4
OCCT 650	Occupational Therapy in Health Care	3
OCCT 651	Administration and Supervision of Occupational Therapy Services	3
OCCT 670	Case-based Clinical Reasoning in Occupational Therapy	2
OCCT 709	Research Process and Statistical Analysis in Occupational Therapy	4
OCCT 729	Research Practicum	3
Fieldwork requirement		
OCCT 636	Fieldwork I in Psychosocial Occupational Therapy	2
OCCT 660	Level I Fieldwork in Occupational Therapy (sections 001 and 002)	2
OCCT 680	Level II Fieldwork in Occupational Therapy: A	9
OCCT 681	Level II Fieldwork in Occupational Therapy: B	9
Total Hours		82

Total graduate credit hours required (minimum) 82

Graduate program director
Dianne F. Simons, Ph.D., OTR/L
Assistant professor, program director and graduate admissions chair
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Additional contacts
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Program manager
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Al Copolillo, Ph.D., OTR/L, FAOTA
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Program website: sahp.vcu.edu/departments/occu/programs (http://www.sahp.vcu.edu/departments/occu/programs)

Occupational Therapy, Master of Science in (M.S.O.T.)/Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined]

The Department of Gerontology, in cooperation with other programs at the university, provides students interested in working with elders or in gerontological settings with the opportunity to complete the Certificate in Aging Studies while also completing requirements for other degree programs. Students must apply separately to the participating programs and must meet all admission and degree requirements for both programs. In some cases, and with the approval of the advisers of both programs, course work in one program may be approved to satisfy a course requirement in another program.

The departments of Occupational Therapy and Gerontology have developed a specialized version of the Certificate in Aging Studies program for students completing the Master of Science in Occupational Therapy.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Students must meet admission requirements for the occupational therapy degree and the aging studies certificate programs.

Curriculum requirements

Course	Title	Hours
Courses		
GRTY 601	Biological and Physiological Aging	3
GRTY/PSYC 602	Psychology of Aging	3
GRTY 603	Social Gerontology	3
Select one of the following:		3
GRTY 606	Aging and Human Values	
GRTY 616	Geriatric Rehabilitation	
GRTY 691	Topical Seminar	
OCCT 691	Special Topics in Occupational Therapy	2
OCCT 709	Research Process and Statistical Analysis in Occupational Therapy	4
OCCT 729	Research Practicum	3
Total Hours		21

Total graduate credit hours required (minimum) 21

Contact the respective departments for additional curriculum information.

Graduate program director
Jennifer Pryor
Department of Gerontology
Email: pryorjm@vcu.edu
Phone: (804) 828-1565

Program website: chp.vcu.edu/gerontology (https://chp.vcu.edu/departments/gerontology)

Department of Patient Counseling

Russell H. Davis, Ph.D.
Professor and chair

Patient counseling is the practice of communicating emphatic concern, support and sensitive spiritual counsel to the physically or emotionally troubled person in the traumas of life. There is a long history of a concerted effort toward this end at VCU Health. With the appointment of Dr. George D. Ossman as chaplain in 1943, the administration gave clear evidence of its awareness of the need for a specialized caring ministry to hospitalized patients and their families.

The chaplaincy program was significantly expanded in 1958 and was accredited to begin the education and clinical training of persons in patient counseling. Since then, a continuous program has been in existence and has evolved into the present program in patient counseling. Patient counseling, as it exists today, became an integrated program in the then-School of Allied Health Professions in 1970. A comprehensive curriculum review was completed in 1999.

With the rapid growth of health care and the increasingly complex problems of medical ethics and viable delivery systems, it is very important to educate qualified persons to deal with the human dimensions of illness as well as the personal and family stressors related to it. Through this program, VCU has an opportunity to make an impact upon health care education by emphasizing the spiritual dimension of human needs in life crises. By so doing, this university has a significant role to play in the important task of keeping health care holistic and utilizing technical and scientific methodology in the context of a deep respect for the total life of persons.

Accreditation

The program is accredited by the Association for Clinical Pastoral Education Inc (https://www.acpe.edu). and is offered in collaboration with VCU Health. Virginia Commonwealth University/VCU Health is accredited to offer CPE (Levels I/II) and Supervisory CPE by the ACPE, 1549 Clairmont Road, Suite 103, Decatur, Georgia, 30033; (404) 320-1472.

Objectives

The programs in patient counseling are designed to assist an individual to work in the health field as one skilled in dealing with the whole person in the context of life's crises and in a cooperative interprofessional team approach. The programs are offered to persons who have an existing identity in a helping or counseling profession. This includes clergy, social workers, institutional counselors, education specialists, psychologists, community health workers and others in the health care professions.

Facilities

West Hospital (W4S) is the base for the educational program, and limited space is available in clinical areas to work with persons and families in crisis. The Main Hospital, mezzanine level, contains the chapel, family consultation room and administrative offices.

Code of ethics

The professional behavior of the student is expected to be in accordance with the Code of Professional Ethics, as adopted by the Association for Clinical Pastoral Education, Inc. and the Code of Ethics of the Association of Professional Chaplains.

Student responsibilities

Students serve in the dual capacity of providing pastoral care service while learning. Extensive clinical involvement, including night and weekend responsibilities, is required for selected courses and clinical pastoral education credit. Each student receives individual supervision by a member of the faculty.

Students who are unsuccessful in demonstrating completion of designated clinical pastoral education outcomes in any program will be required to develop with a faculty mentor an individualized plan of study toward their completion. Typically, this plan will be accomplished through additional course work or a directed independent study.

Continuation requirements, advising, transfer and part-time status

A student must maintain a minimum GPA of 3.0 in all course work completed at VCU. A student who falls below that minimum will have one semester to remedy the deficiency.

A student must register for at least one credit hour each academic year for continuation in the program. Any student who fails to register must have prior approval to do so or be dropped from the program and must reapply for reinstatement.

There is a five calendar-year maximum for students to complete the Master of Science degree and a seven calendar-year maximum for the dual degree. The graduate certificate program must be completed within a four calendar-year maximum. Part-time students who wish to accumulate concurrent ACPE credit need to be sure that course work is completed in accordance with ACPE standards.

A maximum of eight credits may be transferred from another university toward the Master of Science course requirements provided these credits have not been applied to a previous degree. A maximum of one-third of the didactic hours may be transferred from another VCU program. Dual-degree candidates may apply six credits from their seminary studies to the VCU degree. Transfer is given at the discretion of the chair after consultation with the faculty, subject to university approval. Credits are not transferable to either of the certificate programs.

Students who have been admitted to the graduate certificate program may be admitted to the Master of Science degree with advanced standing after the completion of at least 18 credits with a B or better. All credits of a B or better will transfer to the degree program.

Upon admission to all programs students will be assigned a faculty adviser.

- Patient Counseling, Master of Science (M.S.) with a concentration in accelerated chaplain certification (p. 190)
- Patient Counseling, Master of Science (M.S.) with a concentration in chaplain certification (p. 191)
- Patient Counseling, Master of Science (M.S.) with a concentration in supervisory clinical pastoral education (p. 193)
- Patient Counseling, Master of Science (M.S.)/Divinity, Master of (M.Div.) from the Baptist Theological Seminary in Richmond or the Samuel DeWitt Proctor School of Theology at Virginia Union University [combined] (p. 195)
- Patient Counseling, Certificate in (Post-baccalaureate graduate certificate) (p. 188)

Patient Counseling, Certificate in (Post-baccalaureate graduate certificate)

Program accreditation
Association for Clinical Pastoral Education

Program goal

To provide clinical education for pastoral care professionals as well as other health care providers in the spiritual care of patients and families within an interdisciplinary context

Student learning outcomes

1. Students will articulate the central themes and core values of their religious heritage and the theological understanding that informs their ministry (ACPE Standard 311, Outcome 311.1).
2. Students will identify and discuss major life events, relationships and cultural contexts that influence personal identity as expressed in pastoral functioning (ACPE Standard 311, Outcome 311.2).
3. Students will initiate peer group and supervisory consultation and receive critique about one's ministry practice (ACPE Standard 311, Outcome 311.3).
4. Students will risk offering appropriate and timely critique (ACPE Standard 311, Outcome 311.4).
5. Students will recognize relational dynamics within group contexts (ACPE Standard 311, Outcome 311.5).
6. Students will demonstrate integration of conceptual understandings presented in the curriculum into pastoral practice (ACPE Standard 311, Outcome 311.6).
7. Students will initiate helping relationships within and across diverse populations (ACPE Standard 311, Outcome 311.7).
8. Students will use the clinical methods of learning to achieve their educational goals (ACPE Standard 311, Outcome 311.8).
9. Students will formulate clear and specific goals for continuing pastoral formation with reference to personal strengths and weaknesses (ACPE Standard 311, Outcome 311.9).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students receive a Department of Patient Counseling student handbook during orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jun 1	TOEFL: international students
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree or its equivalent from an accredited institution reflecting ability to perform at the graduate level. Students must apply and be accepted to VCU's Graduate School to participate in our Clinical Pastoral Education program. This program also requires the submission of a resume, the Association of Clinical Pastoral Education application materials and a personal interview with faculty. Application fact sheets and narrative instructions can be found on the **ACPE website**.

Applicants holding degrees from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 550 on the TOEFL paper-based examination or 100 on the Internet-based examination. Ability to communicate orally and in writing must be presented to the Department of Patient Counseling Admissions Committee.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete 12 credit hours of study according to one of the established curricula. Course substitutions require faculty approval.

Curriculum requirements

Course	Title	Hours
Core requirements		
PATC 515	Basic Patient Counseling	9
Electives		
PATC 500-level or higher elective		3
Total Hours		12

Total graduate credit hours required (minimum) 12

Graduate program director
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Director of education, assistant professor and ACPE supervisor
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Phone: (804) 828-0540

Additional contact
Russell H. Davis, Ph.D.
Professor and Rev. Robert B. Lantz Chair, Department of Patient Counseling, CPE supervisor (ACPE)
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Phone: (804) 828-0540

Program website: sahp.vcu.edu/ptc (http://www.sahp.vcu.edu/ptc)

Patient Counseling, Master of Science (M.S.), accelerated chaplain certification concentration

Program accreditation
Association for Clinical Pastoral Education

Program goal

To provide clinical education for pastoral care professionals as well as other health care providers in the spiritual care of patients and families within an interdisciplinary context.

Student learning outcomes

1. Graduates will demonstrate awareness of self with congruence in the care of patients, families and staff (ACPE Standard 312, Outcome 312.1).
2. Graduates will demonstrate ability to provide care with sensitivity and respect in a diverse patient, family and staff environment (ACPE Standard 312, Outcome 312.2).
3. Graduates will demonstrate the knowledge and provision of intensive and extensive pastoral/spiritual care to persons in crisis (ACPE Standard 312, Outcome 312.3).
4. Graduates will demonstrate incorporation of theological understanding and knowledge of the behavioral sciences in care of patients, families and staff (ACPE Standard 312, Outcome 312.4).
5. Graduates will demonstrate effective participation as members of a comprehensive health care team (ACPE Standard 312, Outcome 312.5).
6. Graduates will demonstrate responsible care and professional boundaries (ACPE Standard 312, Outcome 312.6).
7. Graduates will demonstrate the utilization of individual and group supervision for personal and professional development as well as ongoing evaluation of clinical practice (ACPE Standard 312, Outcome 312.7).
8. Graduates will demonstrate awareness of professional standards in chaplaincy (ACPE Standard 312, Outcome 312.8).
9. Graduates will demonstrate ability to self-supervise and critically reflect on their own pastoral encounters (ACPE Standard 312, Outcome 312.9).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students receive a Department of Patient Counseling student handbook during orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jun 1	GRE
	Spring	Nov 1	International students required to present TOEFL scores.
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree or its equivalent from an accredited institution reflecting ability to perform at the graduate level, as well graduate degree in a health-related field. Students must apply and be accepted to VCU's Graduate School to participate in the clinical pastoral education program.

Application fact sheets and narrative instructions can be found on the **ACPE website**.

Accelerated chaplain certification concentration in the Master of Science

1. The accelerated chaplain certification concentration in the Master of Science in Patient Counseling is available to students who hold a master's degree and who have completed one unit of ACPE clinical pastoral education.
2. Students admitted to this option must have a minimum GPA of 3.0. Submission of the Graduate Examination Record is required when this GPA requirement is not met.
3. Applicants holding degrees from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 550 on the TOEFL paper-based examination or 100 on the Internet-based examination. The ability to communicate orally and in writing must be presented to the Department of Patient Counseling admissions committee.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 30 credit hours in accordance with the approved curriculum
2. Complete all core courses
3. Complete all required elective course hours

Curriculum requirements

Course	Title	Hours
Core requirements		
PATC 611	Theory and Practice of Patient Counseling I	5
PATC 612	Theory and Practice of Patient Counseling II	5
PATC 613	Group Process I	2
PATC 614	Group Process II	2
PATC 615	Theory of Group Leadership	2
PATC 617	Supervised Clinical Practice I	5
PATC 635	Clinical Ethics	2
PATC 639	Pastoral Care Management	2
PATC 640	Research Basics for Hospital Chaplains	1
PATC 641	Evidence-based Inquiry for Hospital Chaplains	1
PATC 642	Developing and Presenting Chaplaincy Research	1
Electives		
Courses may be taken in patient counseling, gerontology and rehabilitation counseling. Other electives may be allowed with prior permission of the program director and chair.		2
PATC elective course (500 level or higher)		
GRTY elective course (620 and 630 series)		
RHAB elective course (620 and 630 series)		
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Angela H. Flack, M.Div.
Director of education, assistant professor and ACPE supervisor
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Additional contact
Russell H. Davis, Ph.D.
Professor and Rev. Robert B. Lantz Chair, Department of Patient Counseling, CPE supervisor (ACPE)
Email: rhdavis2@vcu.edu
Phone: (804) 828-0540

Program website: sahp.vcu.edu/ptc (http://www.sahp.vcu.edu/ptc)

Patient Counseling, Master of Science (M.S.) with a concentration in chaplain certification

Program accreditation
Association for Clinical Pastoral Education

Program goal

To provide clinical education for pastoral care professionals as well as other health care providers in the spiritual care of patients and families within an interdisciplinary context

Student learning outcomes

1. Graduates will demonstrate awareness of self with congruence in the care of patients, families and staff (ACPE Standard 312, Outcome 312.1).
2. Graduates will demonstrate ability to provide care with sensitivity and respect in a diverse patient, family and staff environment (ACPE Standard 312, Outcome 312.2).

3. Graduates will demonstrate the knowledge and provision of intensive and extensive pastoral/spiritual care to persons in crisis (ACPE Standard 312, Outcome 312.3).
4. Graduates will demonstrate incorporation of theological understanding and knowledge of the behavioral sciences in care of patients, families and staff (ACPE Standard 312, Outcome 312.4).
5. Graduates will demonstrate effective participation as a member of a comprehensive health care team (ACPE Standard 312, Outcome 312.5).
6. Graduates will demonstrate responsible care and professional boundaries (ACPE Standard 312, Outcome 312.6).
7. Graduates will demonstrate the utilization of individual and group supervision for personal and professional development as well as ongoing evaluation of clinical practice (ACPE Standard 312, Outcome 312.7).
8. Graduates will demonstrate awareness of professional standards in chaplaincy (ACPE Standard 312, Outcome 312.8).
9. Graduates will demonstrate ability to self-supervise and critically reflect on their own pastoral encounters (ACPE Standard 312, Outcome 312.9).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students receive a Department of Patient Counseling student handbook during orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1	None
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree or its equivalent from an accredited institution reflecting ability to perform at the graduate level; graduate degree in a health-related field; or two years of graduate theological education. Students must apply and be accepted to VCU's Graduate School to participate in the clinical pastoral education program.

This program also requires submission of the following supplemental material: a current resume, the Association of Clinical Pastoral Education Inc. application materials, copies of all previous self- and supervisor's CPE evaluations and two verbatim case studies of clinical work. An interview with the faculty admission committee will be granted based on application material.

Application fact sheets and narrative instructions can be found on the ACPE website (https://www.acpe.edu/ACPE/Resources/Forms.aspx).

Chaplain certification concentration

1. The chaplain certification concentration is available to individuals who have a previous graduate degree or who have at least two years of graduate education in theology, the behavioral sciences or the health-related sciences. It is assumed that completion of this 44-credit-hour concentration will take four to five semesters.
2. Students admitted to this option must have a minimum GPA of 3.0. Submission of the Graduate Examination Record is required when this GPA requirement is not met.
3. Applicants holding degrees from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 550 on the TOEFL paper-based examination or 100 on the Internet-based examination. Ability to communicate orally and in writing must be presented to the Department of Patient Counseling admissions committee.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 44 credit hours in accordance with the approved curriculum
2. Complete all core courses
3. Complete all required elective course hours

Curriculum requirements

Course	Title	Hours
Core requirements		
PATC 515	Basic Patient Counseling	9
PATC 611	Theory and Practice of Patient Counseling I	5
PATC 612	Theory and Practice of Patient Counseling II	5
PATC 613	Group Process I	2
PATC 614	Group Process II	2
PATC 615	Theory of Group Leadership	2
PATC 617	Supervised Clinical Practice I	5
PATC 635	Clinical Ethics	2
PATC 639	Pastoral Care Management	2
PATC 640	Research Basics for Hospital Chaplains	1
PATC 641	Evidence-based Inquiry for Hospital Chaplains	1
PATC 642	Developing and Presenting Chaplaincy Research	1
Electives		
Courses may be taken in patient counseling, gerontology and rehabilitation counseling. Other electives may be allowed with prior permission of the program director and chair.		7
PATC elective course (500 level or higher)		
GRTY elective course (620 and 630 series)		
RHAB elective course (620 and 630 series)		
Total Hours		44

Total graduate credit hours required (minimum) 44

Graduate program director
Angela H. Flack, M.Div.
Director of education, assistant professor and ACPE supervisor
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Phone: (804) 828-0540

Additional contact
Russell H. Davis, Ph.D.
Professor and Rev. Robert B. Lantz Chair, Department of Patient Counseling, CPE supervisor (ACPE)
Email: rhdavis2@vcu.edu
Phone: (804) 828-0540

Program website: sahp.vcu.edu/ptc (http://www.sahp.vcu.edu/ptc)

Patient Counseling, Master of Science (M.S.) with a concentration in supervisory clinical pastoral education

Program accreditation
Association for Clinical Pastoral Education

Program goal

To provide clinical education for pastoral care professionals as well as other health care providers in the spiritual care of patients and families within an interdisciplinary context

Student learning outcomes

1. Student maintains personal integrity and a deepening pastoral identity (ACPE Standard 315, Outcome 315.1).
2. Student demonstrates emotional and spiritual maturity (ACPE Standard 315, Outcome 315.2).
3. Student forms meaningful pastoral relationships (ACPE Standard 315, Outcome 315.3).
4. Student self-supervises their own ongoing pastoral practice (ACPE Standard 315, Outcome 315.4).
5. Student refines their professional identity as a clinical pastoral educator (ACPE Standard 315, Outcome 315.5).
6. Student demonstrates awareness of how their own culture affects professional and personal identity, pastoral practice, the supervisory relationship and student learning (ACPE Standard 315, Outcome 315.6).
7. Student articulates understanding of and methodology for clinical pastoral supervision based on a critical grasp of the professional literature relating to the field of clinical supervision (Standard 315, Outcome 316.1).
8. Student articulates and implements a philosophy of CPE based on an educational model integrating the theory and practice of CPE, which is based on and congruent with their own theology (Standard 316, Outcome 316.2).
9. Student articulates rationale for multicultural competence, integrating the theory and practice of CPE, which is based on and congruent with their own theology (Standard 316, Outcome 316.3).
10. Student assesses an individual student's learning patterns, personality, religious history and cultural values as a basis for supervisory strategies (ACPE Standard 317.1, Outcome 317.1.1).
11. Student supervises students' pastoral work, giving attention to unique patterns of personal and professional development, including the ability to assist students' movement toward pastoral identity (ACPE Standard 317.1, Outcome 317.1.2).
12. Student defines and evaluates students' pastoral and personal resources, and uses supervisory strategies and interventions to facilitate students' learning and development in pastoral care (ACPE Standard 317.1, Outcome 317.1.3).
13. Student assists students in taking responsibility for formulating a learning process and evaluating the results of the learning experience (ACPE Standard 317.1, Outcome 317.1.4).
14. Student uses their own personality and personal, religious and cultural history as a teaching resource in shaping a personal supervisory style (ACPE Standard 317.1, Outcome 317.1.5).
15. Student facilitates development of group interpersonal interaction (ACPE Standard 317.2, Outcome 317.2.1).

16. Student enables students to use their responses to the program as a learning experience (ACPE Standard 317.2, Outcome, 317.2.2).
17. Student develops and organizes programs of CPE based on program educational principles appropriate to experiential learning (ACPE Standard 318, Outcome 318.1).
18. Student manages CPE programs effectively (ACPE Standard 318, Outcome 318.2).
19. Student develops a variety of CPE program resources (ACPE Standard 318, Outcome 318.3).
20. Student uses diverse clinical educational methods (ACPE Standard 318, Outcome 318.4).
21. Student works with the theological implications of the ministry context (ACPE Standard 318, Outcome 318.5).
22. Student understands and applies professional organizational ethics as they relate to CPE and pastoral practice (ACPE Standard 318, Outcome 318.6).
23. Student uses appropriate clinical skills and teaching methods that integrate the role of context and culture in pastoral practice and education (ACPE Standard 318, Outcome 318.7).
24. Student advocates for students based on awareness of how persons' social locations, systems and structures affect their ministry, learning and the educational context (ACPE Standard 318, Outcome 318.8).
25. Student considers cultural factors in the use of learning assessments, educational strategies, curriculum resources and evaluation procedures (ACPE Standard 318, Outcome 318.9).
26. Student integrates educational theory, knowledge of behavioral science, professional and organizational ethics, theology and pastoral identity into supervisory function (ACPE Standard 319, Outcome 319.1).
27. Student demonstrates awareness of the cultural contexts of diverse student groups and clinical populations that integrates and articulates ethnic identity development and its implications for pastoral practice and supervisory relationships (ACPE Standard 319, Outcome 319.2).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students receive a Department of Patient Counseling student handbook during orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1	GRE
	Spring	Nov 1	International students required (TOEFL)
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree or its equivalent from an accredited institution reflecting ability to perform at the graduate level; graduate degree in a health-related field; or two years of graduate theological education. Students must apply and be accepted to VCU's Graduate School to participate in the clinical pastoral education program.

This program also requires submission of the following supplemental material: a current resume, the Association of Clinical Pastoral Education Inc. application materials, a copy of all previous self- and supervisor's CPE evaluations and two verbatim case studies of clinical work. An interview with the faculty admission committee will be granted based on application material.

Application fact sheets and narrative instructions can be found on the **ACPE website**.

Supervisory clinical pastoral education concentration

1. The supervisory clinical pastoral education concentration is offered to persons seeking certification as supervisors according to the Standards of the Association for Clinical Pastoral Education Inc.
2. This degree concentration is available to students who hold a master's degree or equivalency and who have completed a minimum of four units of ACPE clinical pastoral education.
3. Students admitted to this option must have a minimum GPA of 3.0. Submission of the Graduate Examination Record is required when this GPA requirement is not met.
4. Applicants holding degrees from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 550 on the TOEFL paper-based examination or 100 on the Internet-based examination. The ability to communicate orally and in writing must be presented to the Department of Patient Counseling admissions committee.
5. Each full-time semester at VCU is designed to meet the requirements for one unit of supervisory CPE as accredited by the Association for Clinical Pastoral Education, Inc.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Follow, under faculty guidance, the procedures outlined in ACPE's Manual on Certification
2. Meet with faculty annually for review of progress and continuation in the program
3. Complete a minimum of 44 credit hours in accordance with the approved curriculum
4. Complete all core courses
5. Complete all required elective course hours

Students who have completed degree requirements may continue to enroll as special students if completing residency requirements at VCU Medical Center or certification requirements with the ACPE.

Curriculum requirements

Only students admitted to this concentration are eligible to take courses numbered 653 through 696.

Course	Title	Hours
Core curriculum		
PATC 615	Theory of Group Leadership	2
PATC 640	Research Basics for Hospital Chaplains	1
PATC 641	Evidence-based Inquiry for Hospital Chaplains	1
PATC 642	Developing and Presenting Chaplaincy Research	1
PATC 653	Patient Counseling Evaluation I	4
PATC 654	Patient Counseling Evaluation II	4
PATC 661	History of Pastoral Supervision	3
PATC 663	Theory of Pastoral Supervision I	3
PATC 664	Theory of Pastoral Supervision II	2
PATC 694	Advanced Clinical Pastoral Supervision	7
PATC 696	Intensive Supervisory Practicum	9
Electives		
Options for completing seven hours of elective study include the following: [1]		7
PATC 665	Selected Topics in Pastoral Supervision (may be repeated for total of four credits)	
PATC 692	Independent Study in Pastoral Supervision (may be repeated for total of four credits)	
PATC 697	Clinical Research (may be repeated for total of five credits)	
Total Hours		44

1

Other electives may be allowed with prior permission of the program director and chair.

Total graduate credit hours required (minimum) 44

Graduate program director
Angela H. Flack, M.Div.
Director of education, assistant professor and ACPE supervisor
Email: aflack@vcu.edu
Phone: (804) 828-0540

Additional contact
Russell H. Davis, Ph.D.
Professor and Rev. Robert B. Lantz Chair, Department of Patient Counseling, CPE supervisor (ACPE)
Email: rhdavis2@vcu.edu
Phone: (804) 828-0540

Program website: sahp.vcu.edu/ptc (http://www.sahp.vcu.edu/ptc)

Patient Counseling, Master of Science (M.S.)/Divinity, Master of (M.Div.) from the Baptist Theological Seminary in Richmond or the Samuel DeWitt Proctor School of Theology at Virginia Union University [combined]

Program accreditation
Association for Clinical Pastoral Education

Program goal

To provide clinical education for pastoral care professionals as well as other health care providers in the spiritual care of patients and families within an interdisciplinary context

Student learning outcomes

1. Graduates will demonstrate awareness of self with congruence in the care of patients, families and staff (ACPE Standard 312, Outcome 312.1).
2. Graduates will demonstrate ability to provide care with sensitivity and respect in a diverse patient, family and staff environment (ACPE Standard 312, Outcome 312.2).

3. Graduates will demonstrate the knowledge and provision of intensive and extensive pastoral/spiritual care to persons in crisis (ACPE Standard 312, Outcome 312.3).
4. Graduates will demonstrate incorporation of theological understanding and knowledge of the behavioral sciences in care of patients, families and staff (ACPE Standard 312, Outcome 312.4).
5. Graduates will demonstrate effective participation as a member of a comprehensive health care team (ACPE Standard 312, Outcome 312.5).
6. Graduates will demonstrate responsible care and professional boundaries (ACPE Standard 312, Outcome 312.6).
7. Graduates will demonstrate the utilization of individual and group supervision for personal and professional development as well as ongoing evaluation of clinical practice (ACPE Standard 312, Outcome 312.7).
8. Graduates will demonstrate awareness of professional standards in chaplaincy (ACPE Standard 312, Outcome 312.8).
9. Graduates will demonstrate ability to self-supervise and critically reflect on their own pastoral encounters (ACPE Standard 312, Outcome 312.9).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Other information

Students receive a Department of Patient Counseling student handbook during orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall (preferred)	Jun 1	GRE
		Nov 1	TOEFL (required for international students)
		Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree or its equivalent from an accredited institution reflecting ability to perform at the graduate level; graduate degree in a health-related field; or two years of graduate theological education. Students must apply and be accepted to VCU's Graduate School to participate in the clinical pastoral education program.

Application fact sheets and narrative instructions can be found on the **ACPE website**.

Combined Master of Science in Patient Counseling and Master of Divinity

1. The dual degree (M.S./M.Div.) option is offered cooperatively with two Richmond-area graduate institutions of theological education (the Baptist Theological Seminary at Richmond and the Samuel DeWitt Proctor School of Theology of Virginia Union University).
2. The program is designed as a four-year program with four full semesters spent in residence at VCU. Typically, students apply to the Department of Patient Counseling during the first semester of seminary enrollment.
3. Students admitted to this option must have a minimum GPA of 3.0. Submission of the Graduate Examination Record is required when this GPA requirement is not met.
4. Applicants holding degrees from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 550 on the TOEFL paper-based examination or 100 on the Internet-based examination. The ability to communicate orally and in writing must be presented to the Department of Patient Counseling admissions committee.
5. Students enrolled in the dual-degree program will remain in good standing at VCU while enrolled in their seminary studies. Each sponsoring institution will grant its respective degree.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 44 credit hours in accordance with the approved curriculum
2. Complete all core courses
3. Complete all required elective course hours
4. Submit official seminary transcript with VCU Application to Graduate

Final granting of the Master of Science degree requires an oral review with the faculty demonstrating completion of outcomes for Level II Clinical Pastoral Education or Supervisory Clinical Pastoral Education as determined by the chosen track of study.

Curriculum requirements

Course	Title	Hours
Core curriculum		
PATC 515	Basic Patient Counseling	9
PATC 611	Theory and Practice of Patient Counseling I	5
PATC 612	Theory and Practice of Patient Counseling II	5
PATC 613	Group Process I	2
PATC 614	Group Process II	2
PATC 615	Theory of Group Leadership	2
PATC 617	Supervised Clinical Practice I	5
PATC 635	Clinical Ethics	2-3
PATC 639	Pastoral Care Management	2
PATC 640	Research Basics for Hospital Chaplains	1
PATC 641	Evidence-based Inquiry for Hospital Chaplains	1
PATC 642	Developing and Presenting Chaplaincy Research	1
Pastoral care (seminary course)		3
Ethics (seminary course)		3
Elective		
Course may be taken in patient counseling, gerontology and rehabilitation counseling. Other electives may be allowed with prior permission of the program director and chair.		1
PATC elective course (500 level or higher)		
GRTY elective course (620 and 630 series)		
RHAB elective course (620 and 630 series)		
Total Hours		44-45

Total graduate credit hours required (minimum) 44

Graduate program director
Angela H. Flack, M.Div.
Director of education, assistant professor and ACPE supervisor
Email: aflack@vcu.edu
Phone: (804) 828-0540

Additional contact
Russell H. Davis, Ph.D.
Professor and Rev. Robert B. Lantz Chair, Department of Patient Counseling, CPE supervisor (ACPE)
Email: rhdavis2@vcu.edu
Phone: (804) 828-0540

Program website: sahp.vcu.edu/ptc (http://www.sahp.vcu.edu/ptc)

Department of Physical Therapy

Mary Snyder Shall, P.T., Ph.D.
Professor and chair

The Department of Physical Therapy was established in 1931 to provide basic preparation for the practice of physical therapy. Between 1931 and 1954, the program consisted of a 12-month professional course designed to train students for entry into the profession. This program was based upon at least three years of college work or the possession of a registered nurse certificate. A two-year professional program after two years of preparatory college work was initiated in 1954. This program led to the degree of Bachelor of Science in Physical Therapy. In 1968, the Department of Physical Therapy became part of the then-School of Allied Health Professions. The two-year professional program leading to the Bachelor of Science degree continued through the 1988-89 academic year.

In August 1989, the department began a three-year professional program based on three years of previous college work that leads to a Master of Science degree. On Feb. 8, 2001 the VCU Board of Visitors approved a proposal to offer a Doctor of Physical Therapy as the entry-level professional degree. The State Council of Higher Education in Virginia gave its final approval for the proposal on June 20, 2001. The first class to study the professional program began in July 2002.

In addition to the professional program, the department participates in three collaborative and interdisciplinary Ph.D. programs.

Mission

The mission of the VCU Department of Physical Therapy is to serve the commonwealth of Virginia and the nation by:

- Advancing excellence in entry-level and post-entry-level education
- Generating innovative scientific discovery
- Impacting the health of the community through leadership

Philosophy

Physical therapy is an integral part of the health care system. Expanding knowledge in the basic and clinical sciences, and changes in the needs and mandates of society, continually place new demands on the physical therapy profession. The faculty of the Department of Physical Therapy is committed to providing educational programs responsive to expanding knowledge and the needs of society.

The primary principle directing the activities of the department is the faculty's commitment to optimal patient care through physical therapy education, research and practice. The faculty strongly believes that physical therapists must have a thorough understanding of the theory and evidence that form the basis of contemporary patient/client management. In addition, physical therapists must be excellent problem-solvers and must demonstrate the highest levels of professionalism in their interactions with patients/clients, families and colleagues. The faculty also believes that physical therapists have a responsibility to develop skills for lifelong learning and to engage in service to the profession and to their communities.

Objectives

The objectives of the Department of Physical Therapy, in concert with the mission of the university and the College of Health Professions, are to:

- Provide an entry-level post-baccalaureate educational program for full-time students with diverse backgrounds and experiences
- Contribute to interdisciplinary post-professional doctoral programs that prepare physical therapists to contribute to the understanding and application of therapeutic procedures through basic and applied research and to teach both clinical and didactic physical therapy on all academic levels
- Provide an atmosphere that fosters critical thinking, intellectual curiosity and integrity, freedom of expression, personal growth and professional competence, and a commitment to learning for faculty and students

- Provide an environment that facilitates research and scholarship directed toward optimizing patient care
- Provide services to the public and professional communities

Facilities

The educational facilities for the Department of Physical Therapy are located on the basement floor of A.D. Williams/West Hospital. These buildings, located on the northeast corner of 12th and Broad streets, house administrative and faculty offices, classrooms, physical therapy instructional, computer and research laboratories, and student locker rooms. Classrooms in other buildings on the MCV Campus are used as needed.

Clinical education experiences for professional students are offered in physical therapy clinics throughout Virginia and the country.

Graduate (post-professional) programs in physical therapy

The Department of Physical Therapy is committed to improving physical therapy services through graduate education and research. The department participates in cooperative and interdisciplinary doctoral programs. An interdisciplinary Ph.D. in Rehabilitation and Movement Science is offered in conjunction with two other departments at VCU: the Department of Kinesiology and Health Sciences in the College of Humanities and Sciences and the Department of Physical Medicine and Rehabilitation in the School of Medicine. Also, the department participates in the College of Health Professions' Ph.D. in Health Related Sciences.

Education at the Ph.D. level is a highly independent adventure. The curricula offered by the Department of Physical Therapy through joint ventures with other departments allow students the opportunity to focus on highly divergent aspects of research related to physical therapy. Each of the programs also offers students opportunity to hone teaching skills in preparation for a well-rounded academic career.

Regardless of the chosen program or track, each Ph.D. student conducts a substantial original research project. Individuals interested in doctoral education are encouraged to examine the research interest areas of faculty in each of the participating departments and to consult with the program directors before submitting their application to a specific program.

Admission requirements

Applications are encouraged from individuals who are practicing physical therapists. Applicants must have graduated from a physical therapy educational program approved by the American Physical Therapy Association. International students must have an equivalent level of education as determined by the International Admissions. Individuals who are not physical therapists are not accepted into the advanced degree programs.

Additional admission requirements for graduate study in the Department of Physical Therapy are as follows:

1. A minimum GPA of 2.7 on a 4.0 scale for entry-level professional education
2. Satisfactory score on the general test of the GRE (taken no more than five years prior to admission)
3. Three satisfactory letters of recommendation
4. Applicant's written statement of intent for pursuing graduate studies in a particular program
5. Such additional requirements as established for each specific program

International students also must score a 600 or above on the Test of English as a Foreign Language (250 on computer-based test).

Financial assistance

Some teaching and research assistantships are available from the department. These assistantships are competitive. Part-time employment as a physical therapy clinician is available in Richmond and surrounding areas. Doctoral students receiving stipends must receive approval of outside employment.

VCU provides three types of student assistance: scholarships, loans and work-study. For information on these types of financial assistance, write to the Office of Financial Aid, Virginia Commonwealth University, MCV Campus, Richmond, VA 23298-0244.

Priority consideration is given to applications received by Jan. 9.

- Physical Therapy, Doctor of (D.P.T.) (p. 198)
- Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in exercise physiology (p. 202)
- Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in neuromusculoskeletal dynamics (p. 204)

Physical Therapy, Doctor of (D.P.T.)

Program accreditation
Commission on Accreditation in Physical Therapy Education

The Department of Physical Therapy serves the people of the commonwealth of Virginia and the nation by providing educational programs related to physical therapy. The department provides an environment that encourages education through problem solving, free inquiry, professional behavior and scholarship. The department's primary focus is to prepare individuals for general physical therapy practice. These practitioners are educated to serve as an entry point into the health care system for consumers. Post-professional programs provide quality education leading to careers in teaching and research. The department also provides assistance and services to the community and engages in research and scholarly activities related to the practice of physical therapy.

Preparation of physical therapists

VCU's Department of Physical Therapy offers a three-year degree program leading to a Doctor of Physical Therapy. The program prepares students for entry into the profession by teaching them to evaluate and manage patients with physical therapy problems effectively and in accordance with ethical principles. It also provides students with strategies to continually define and meet their own educational needs in order to keep skills and knowledge current throughout their professional careers.

Expected student outcomes

Satisfactory performance in the experiences provided in the Doctor of Physical Therapy program prepares the graduate to:

1. Demonstrate professional behavior in a manner consistent with APTA Code of Ethics and APTA Core Values

2. Adhere to legal practice standards, including all federal, state and institutional regulations related to patient/client care and fiscal management
3. Communicate effectively with all stakeholders, including patients/clients, family members, caregivers, practitioners, interprofessional team members, consumers, payers and policymakers
4. Adapt delivery of physical therapy services with consideration for patients' differences, values, preferences and expressed needs in all professional activities
5. Integrate basic principles of critical inquiry to evaluate, interpret and utilize professional literature in clinical practice, participate in clinical research activities, and critically analyze new concepts in the application of physical therapy practice
6. Apply current knowledge, theory and professional judgment, while considering the patient/client perspective, the environment and available resources
7. Determine, with each patient encounter, the patient's need for further examination or consultation by a physical therapist or referral to another health care professional
8. Perform a physical therapy patient examination using evidenced-based tests and measures that are appropriate to the patient's age, diagnosis and health status
9. Evaluate data from the patient examination (history, systems review, and tests and measures) to determine a diagnosis, prognosis, client goals and expected outcomes that guide future patient management
10. Establish and manage a safe and effective physical therapy plan of care that is consistent with professional obligations, interprofessional collaborations, and administrative policies and procedures of the practice environment
11. Perform physical therapy interventions in a competent manner to achieve patient/client goals and outcomes
12. Educate others (patients, caregivers, staff, students, other health care providers, business and industry representatives, school systems) using relevant and effective teaching methods
13. Produce accurate documentation that follows guidelines and specific documentation formats required by state practice acts, the practice setting and other regulatory agencies.
14. Collect and analyze data from selected outcome measures in a manner that supports accurate analysis of individual patient and group outcomes
15. Direct and supervise personnel to meet patient's goals and expected outcomes according to legal standards and ethical guidelines
16. Demonstrate a commitment to lifelong learning and the physical therapy profession by serving as an advocate for the profession and the health care needs of society

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

A hard copy of the VCU D.P.T. program student handbook and policies and procedures manual is distributed to each entering physical therapy student at orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
D.P.T.	Summer	The beginning of November of the year prior to intended enrollment	GRE

	For non-native English-speaking applicants, regardless of immigration status, a TOEFL score of at least 600 (score of 250 on computerized exam)
	All test scores should be reported directly to VCU.

Special requirements

- The VCU Department of Physical Therapy participates in the American Physical Therapy Association-sponsored physical therapy centralized application service for applicants to the D.P.T. program. All students interested in applying to this program must submit their application materials directly to PTCAS. Applicants who apply through PTCAS will submit a completed Web-based application comprising biographical data, colleges and universities attended, academic course history, physical therapy observation hours, list of reference providers, work experience, extracurricular activities, honors, professional licenses and a personal essay. It is the applicant's responsibility to read and follow all PTCAS and program-specific instructions. Please visit the Department of Physical Therapy website for application deadlines.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

1. A Bachelor of Arts or Bachelor of Science degree from an accredited college or university
2. A minimum grade-point average of 2.7 (in a 4.0 system)
3. A minimum total of 45 volunteer hours in at least two physical therapy practice settings
4. Three recommendations, at least one of which is from a physical therapist

Prerequisites for admission to the professional Doctor of Physical Therapy program include a Bachelor of Arts or Bachelor of Science degree from an accredited college or university. If the applicant has received college credit hours for AP courses and/or exams, and those hours are listed on the university transcript, those credit hours will be accepted. A grade of D in any required prerequisite course is not acceptable. A minimum GPA of 2.7 (in a 4.0 system) is required to be considered for admission. The GRE is required; the scores should be reported directly to Virginia Commonwealth University. For non-native English-speaking applicants, regardless of immigration status, a Test of English as a Foreign Language score of at least 600 (score of 250 on computerized exam) is required; scores should be reported directly to Virginia Commonwealth University.

The program of study necessary to be considered for admission to the professional Doctor of Physical Therapy program must include a minimum of the following subject areas and credits:

Biological sciences – 12 credit hours including laboratory experiences

- Must include four credit hours of college-level biology
- Must include four credit hours of anatomy and four credit hours of human physiology, or eight credit hours of anatomy/physiology (An exercise physiology course is not an acceptable substitute for a human physiology course.)
- Cell biology and histology highly recommended but not required

Chemistry – eight credit hours including laboratory experiences

Mathematics – three credit hours (must be in pre-calculus or a more advanced mathematics course)

Physics – eight credit hours of general physics with laboratory (Courses that emphasize mechanics, electricity, heat and light are highly recommended.)

Psychology – six credit hours (One introductory course and one course in human growth and development or abnormal psychology is required.)

Statistics – three credit hours

In order to complete the total requirements, students are encouraged to elect courses from the following categories: computer science, embryology, histology, cell biology, comparative anatomy, kinesiology, exercise physiology, foreign languages and courses in physical education dealing with an analytical approach to human movement or motor learning.

Students must also present a minimum of 45 volunteer hours in at least two physical therapy practice settings.

Students are required to have current CPR certification.

One of the three required letters of recommendation must be from a physical therapist.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), every professional physical therapy program student must maintain a minimum cumulative grade point average of 3.0. At the end of each semester, the faculty reviews the academic performance of all students. All students must have a GPA of 3.0 by the end of the second academic year in order to matriculate into PHTY 680 in the third academic year. Physical therapy students must complete all clinical education experiences to the satisfaction of the clinical and academic faculty.

Under no circumstances are physical therapy students permitted to participate in graduation ceremonies if they have not satisfactorily completed all the requirements of the professional physical therapy program curriculum.

Curriculum requirements

Course	Title	Hours
IPEC 501	Foundations of Interprofessional Practice	1
PHTY 501	Gross Anatomy (Physical Therapy)	7
PHTY 502	Kinesiology	4
PHTY 503	Applied Exercise Physiology	3
PHTY 505	Applied Microscopic Anatomy for Physical Therapy	4
PHTY 506	Functional Neuroanatomy	4

PHTY 508	Musculoskeletal Physical Therapy I	6
PHTY 510	Rehabilitation I	3
PHTY 512	Health Care Systems	2
PHTY 520	Clinical Education I	3
PHTY 531	Evidence-based Practice Concepts	2
PHTY 537	Rehabilitation II	3
PHTY 540	Psychosocial Aspects of Physical Therapy	1
PHTY 609	Clinical Biomechanics	3
PHTY 615	Pharmacology (Physical Therapy)	1
PHTY 621	Therapeutic Agents	4
PHTY 623	Cardiopulmonary Physical Therapy	3
PHTY 624	Clinical Problem-solving I	2
PHTY 626	Lifespan I	6
PHTY 627	Lifespan II	2
PHTY 640	Neurologic Physical Therapy	6
PHTY 644	Orthotics and Prosthetics	2
PHTY 646	Clinical Medicine	2
PHTY 648	Musculoskeletal Physical Therapy II	5
PHTY 650	Clinical Education II	8
PHTY 651	Professional Issues in Physical Therapy	2
PHTY 654	Clinical Problem-solving II	1
PHTY 660	Musculoskeletal Physical Therapy III	2
PHTY 661	Administration and Management in Physical Therapy	2
PHTY 670	Clinical Integration of Physical Therapy Concepts	2
PHTY 674	Clinical Problem-solving III	1
PHTY 676	Comprehensive Study of Physical Therapy Practice	1
PHTY 680	Clinical Education III	12
PHTY 695	Clinical Education IV	12
Total Hours		122

Total graduate credit hours required (minimum) 122

Sample plan of study

Summer semester		
Prior to year one		
PHTY 501	Gross Anatomy (Physical Therapy)	7
	Term Hours:	7
P1 year		
Fall semester		
IPEC 501	Foundations of Interprofessional Practice	1
PHTY 502	Kinesiology	4
PHTY 503	Applied Exercise Physiology	3
PHTY 505	Applied Microscopic Anatomy for Physical Therapy	4
PHTY 510	Rehabilitation I	3
PHTY 531	Evidence-based Practice Concepts	2
PHTY 615	Pharmacology (Physical Therapy)	1
	Term Hours:	18
Spring semester		
PHTY 506	Functional Neuroanatomy	4
PHTY 508	Musculoskeletal Physical Therapy I	6
PHTY 520	Clinical Education I	3
PHTY 537	Rehabilitation II	3
PHTY 540	Psychosocial Aspects of Physical Therapy	1
PHTY 623	Cardiopulmonary Physical Therapy	3
	Term Hours:	20
Summer semester		
No courses required		
	Term Hours:	0
P2 year		
Fall semester		
PHTY 512	Health Care Systems	2
PHTY 609	Clinical Biomechanics	3
PHTY 621	Therapeutic Agents	4
PHTY 624	Clinical Problem-solving I	2
PHTY 648	Musculoskeletal Physical Therapy II	5
PHTY 661	Administration and Management in Physical Therapy	2
	Term Hours:	18
Spring semester		
PHTY 626	Lifespan I	6
PHTY 627	Lifespan II	2
PHTY 640	Neurologic Physical Therapy	6
PHTY 644	Orthotics and Prosthetics	2
PHTY 646	Clinical Medicine	2
	Term Hours:	18
Summer semester		
PHTY 650	Clinical Education II	8
	Term Hours:	8
P3 year		
Fall semester		
Block 1-8 weeks		
PHTY 651	Professional Issues in Physical Therapy	2
PHTY 654	Clinical Problem-solving II	1
PHTY 670	Clinical Integration of Physical Therapy Concepts	2
PHTY 676	Comprehensive Study of Physical Therapy Practice	1
PHTY 660	Musculoskeletal Physical Therapy III	2
Block 2-12 weeks		
PHTY 680	Clinical Education III	12
	Term Hours:	20
Spring semester		
PHTY 674	Clinical Problem-solving III	1
PHTY 695	Clinical Education IV	12
	Term Hours:	13
	Total Hours:	122

Graduate program director

Mary S. Shall, P.T., Ph.D.
Professor and chair, Department of Physical Therapy
Email: msshall@vcu.edu

Phone: (804) 828-0234

Additional contact
Melissa Lee
D.P.T. admissions coordinator
Email: mlee27@vcu.edu
Phone: (804) 828-0234

Program website: sahp.vcu.edu/departments/pt/prospective-students/dpt-professional-degree (http://sahp.vcu.edu/departments/pt/prospective-students/dpt-professional-degree)

Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in exercise physiology [College of Health Professions]

Program goal

The Ph.D. in Rehabilitation and Movement Science is an interdisciplinary degree program developed through a collaborative partnership of the departments of Kinesiology and Health Sciences, Physical Therapy, and Physical Medicine and Rehabilitation. The mission of this collaborative degree program is to prepare applied scientists capable of approaching multifaceted health care, preventive medicine and rehabilitation initiatives from an integrative perspective and to prepare graduates to assume research, teaching and leadership positions within rehabilitation and movement science professions.

There are two program concentrations: exercise physiology and neuromusculoskeletal dynamics. The exercise physiology concentration prepares individuals to conduct research, direct external funding initiatives and teach in the area of exercise physiology, with particular focus on physical activity's impact on chronic disease states. The neuromusculoskeletal dynamics concentration prepares individuals for research, teaching and clinical initiatives associated with the identification and rehabilitation of movement disorders.

Student learning outcomes

At the completion of the program students will:

1. Demonstrate comprehensive foundational knowledge within his/her area of program
specialization
2. Develop testable hypotheses and appropriate study designs to address relevant research
questions in his/her area of program specialization
3. Develop the skills and abilities to collect and manage research data while ensuring ethical
and responsible conduct of research
4. Develop the ability to analyze research data and subsequently interpret and synthesize
results and draw appropriate conclusions
5. Demonstrate teaching effectiveness in the classroom and/or clinical environment
6. Disseminate research findings effectively in oral and/or written formats

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan. 9 will be given priority consideration. Applications received following the deadline may be considered if space and resources are available.	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have completed at least one of a master's degree in a related area, 30 hours of post-baccalaureate work (e.g. course work at 500 level or greater) or a first-professional degree program
2. Provide official GRE score
3. Submit a curriculum vitae or professional resume indicating an applicant's educational and career experience as well as evidence of research potential

Admission decisions are made only on the basis of a completed application packet.

Applicants being considered for admission must complete an interview with a Ph.D. admissions committee representative and/or research faculty member with whom the student would like to work.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students pursuing the Ph.D. in Rehabilitation and Movement Science must successfully complete:

1. A minimum of 50 credit hours developed in conjunction with their advisers
2. Written and oral comprehensive examinations
3. All other university requirements of qualification for degree candidacy
4. Written dissertation based on a focused line of research
5. Oral defense of the dissertation

Curriculum requirements

Course	Title	Hours
Research core courses		
STAT/BIOS 543	Statistical Methods I	3
STAT/BIOS 544	Statistical Methods II	3
Select one of the following:		3
ALHP 761	Health Related Sciences Research Design	
EDUS 710	Quantitative Research Design	
HADM 761	Health Services Research Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	
PSYC 636	Research Methods in Developmental Psychology	
Select one additional research design class of above or of the following:		3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	
BIOS 531	Clinical Epidemiology	
BIOS 553	Biostatistical Methods I	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
SBHD 610	Behavioral Measurement	
Core concentration		
PHIS 501	Mammalian Physiology	5
REMS 701	Advanced Exercise Physiology I	3
Select one of the following:		3
REMS 703	Cardiovascular Exercise Physiology	
REMS 704	Psychobiology of Physical Activity	
REMS 705	Metabolic Aspects of Physical Activity	
Approved electives (from list below)		7
Labratory rotations		
REMS 710	Research Techniques in Rehabilitation and Movement Science	3
Professional development course work		
REMS 690	Research Seminar in Rehabilitation and Movement Science (.5 credit-hour course repeated for a total of 3 credits)	3
REMS 793	Teaching Practicum in Higher Education	1
REMS 794	Research Presentation Seminar	1
Dissertation research		
REMS 798	Research in Rehabilitation and Movement Science	12
Total Hours		50

Approved electives

Course	Title	Hours
BIOL 524	Endocrinology	3
HEMS 610	Laboratory Techniques in Rehabilitation Science	3
HEMS 675	Clinical Exercise Physiology	3
PHTX 614	Foundation in Psychoneuroimmunology	3
REMS/HEMS 660	Neuromuscular Performance	3
REMS 692	Independent Study	1-3
REMS 702	Advanced Exercise Physiology II	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

Total graduate credit hours required (minimum) 50

Graduate program director

Ronald K. Evans, Ph.D.
Associate professor and director of graduate studies, Department of Kinesiology and Health Sciences
rkevans@vcu.edu

(804) 828-1948

Additional contact
Sheryl D.G. Finucane, Ph.D., P.T.
Assistant professor and graduate program director, Department of Physical Therapy
sfinucan@vcu.edu
(804) 828-0234

Program website: sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science (http://sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science)

Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in neuromusculoskeletal dynamics [College of Health Professions]

Program goal

The Ph.D. in Rehabilitation and Movement Science is an interdisciplinary degree program developed through a collaborative partnership of the departments of Kinesiology and Health Sciences, Physical Therapy, and Physical Medicine and Rehabilitation. The mission of this collaborative degree program is to prepare applied scientists capable of approaching multifaceted health care, preventive medicine and rehabilitation initiatives from an integrative perspective and to prepare graduates to assume research, teaching and leadership positions within rehabilitation and movement science professions.

There are two program concentrations: exercise physiology and neuromusculoskeletal dynamics. The exercise physiology concentration prepares individuals to conduct research, direct external funding initiatives and teach in the area of exercise physiology, with particular focus on physical activity's impact on chronic disease states. The neuromusculoskeletal dynamics concentration prepares individuals for research, teaching and clinical initiatives associated with the identification and rehabilitation of movement disorders.

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At the completion of the program students will:

1. Demonstrate comprehensive foundational knowledge within his/her area of program
specialization
2. Develop testable hypotheses and appropriate study designs to address relevant research
questions in his/her area of program specialization
3. Develop the skills and abilities to collect and manage research data while ensuring ethical
and responsible conduct of research
4. Develop the ability to analyze research data and subsequently interpret and synthesize
results and draw appropriate conclusions
5. Demonstrate teaching effectiveness in the classroom and/or clinical environment
6. Disseminate research findings effectively in oral and/or written formats

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
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In addition to general VCU Graduate School graduation requirements (p. 31), students pursuing the Ph.D. in Rehabilitation and Movement Science must successfully complete:

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2. Written and oral comprehensive examinations
3. All other university requirements of qualification for degree candidacy
4. Written dissertation based on a focused line of research
5. Oral defense of the dissertation

Curriculum requirements

Course	Title	Hours
Research core courses		
STAT 543	Statistical Methods I	3
or BIOS 543	Graduate Research Methods I	
STAT 544	Statistical Methods II	3
or BIOS 544	Graduate Research Methods II	
Select one of the following:		3
ALHP 761	Health Related Sciences Research Design	
EDUS 710	Quantitative Research Design	
HADM 761	Health Services Research Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	
PSYC 636	Research Methods in Developmental Psychology	
Select one additional research design class of above or of the following:		3
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BIOS 553	Biostatistical Methods I	
BIOS 531	Clinical Epidemiology	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
SBHD 610	Behavioral Measurement	
Core concentration		
REMS/HEMS 611	Biomechanics of Human Motion	3
REMS/HEMS 660	Neuromuscular Performance	3
REMS 665	Instrumentation in Motion Analysis	3
Approved electives (from list below)		9
Labratory rotations		
REMS 710	Research Techniques in Rehabilitation and Movement Science	3
Professional development course work		
REMS 690	Research Seminar in Rehabilitation and Movement Science (.5 credit-hour course repeated for a total of 3 credits)	3
REMS 793	Teaching Practicum in Higher Education	1
REMS 794	Research Presentation Seminar	1
Dissertation research		
REMS 798	Research in Rehabilitation and Movement Science	12
Total Hours		50

Approved electives

Course	Title	Hours
EPID 622	Maternal and Child Health	3
HEMS 601	Movement Physiology	3
PSYC 603	Developmental Processes	3
PSYC 614	Development in Infancy and Early Childhood	3
REMS/PHTY 608	Advanced Musculoskeletal Sciences	3
REMS/PHTY 612	Advanced Biomechanics	3
REMS 692	Independent Study	1-3
REMS 701	Advanced Exercise Physiology I	3
REMS 702	Advanced Exercise Physiology II	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

Total graduate credit hours required (minimum) 50

Graduate program director

Sheryl D.G. Finucane, Ph.D., P.T.

Assistant professor and graduate program director, Department of Physical Therapy

sfinucan@vcu.edu
(804) 828-0234

Additional contact
Ronald K. Evans, Ph.D.
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Program website: sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science (http://sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science)

Department of Radiation Sciences

Jeffrey S. Legg, Ph.D., RT(R)(CT)(QM)
Associate professor and chair

sahp.vcu.edu/departments/radsci (http://sahp.vcu.edu/departments/radsci)

The Department of Radiation Sciences is an integral part of the College of Health Professions and shares its values. The department serves as a national leader in the education of students in the radiation sciences and provides learning opportunities that are innovative and educationally sound. Strong linkages with clinical affiliates and their staffs are vital to the department's success. Faculty and staff work in a cooperative spirit in an environment conducive to inquisitiveness and independent learning to help a diverse student body develop to its fullest potential. The faculty is committed to the concept of lifelong learning and promotes standards of clinical practice that will serve students throughout their professional careers. Faculty members serve as resources for professionals in practice and contribute to an expanded knowledge base in the field of clinical radiation sciences.

The mission of the Department of Radiation Sciences is to enable a diverse student body to develop its fullest potential and to graduate baccalaureate-level radiologic health professionals who demonstrate outstanding technical, communication and critical-thinking skills.

Department of Radiation Sciences' goals

1. For entry-level and second modality programs, students will be clinically competent.
   a. Students will attain clinical competence.
   b. Graduates will demonstrate clinical competence while employed in the radiation sciences.
2. Students will communicate effectively.
   a. Students will demonstrate effective communication during their clinical experience.
   b. Students will demonstrate effective communication through the research project.
   c. Graduates will demonstrate effective communication while employed in the radiation sciences.
3. Students will demonstrate critical-thinking skills.
   a. Students will demonstrate critical-thinking skills during their clinical experience.
   b. Students will demonstrate critical-thinking skills in developing their research project.
4. Students will model professionalism.
   a. Students will demonstrate professionalism during their clinical experience.
   b. Graduates will demonstrate professionalism while employed in the radiation sciences.
5. The department will assure program effectiveness.

History

Radiologic technology education began at the Medical College of Virginia in the 1930s with a one-year training program in radiography. This program has undergone a number of changes through the years to evolve into the current baccalaureate educational program.

A concentration in nuclear medicine technology was added in 1984 and in radiation therapy in 1992. Degree-completion programs have been added to provide an opportunity for certified technologists and therapists to complete requirements for the baccalaureate degree.

Facilities

The educational facilities for the Department of Radiation Sciences are located at 701 W. Grace St., Suite 2100. These facilities include energized laboratories in radiography, nuclear medicine, radiation therapy and mammography. The radiography laboratory includes a digital imaging system. In addition, the radiation therapy laboratory has a 3-D treatment planning system.

During the various phases of the curriculum, students will be assigned to one or more of the following affiliate institutions: VCU Health's MCV Hospitals, McGuire VA Medical Center, Southside Regional Medical Center, Henrico Doctors' Hospitals and a variety of smaller clinics and facilities.

Department of Rehabilitation Counseling

Amy J. Armstrong, Ph.D.
Associate professor and chair

sahp.vcu.edu/rehab (http://sahp.vcu.edu/departments/rehab)

Founded in 1955, the Department of Rehabilitation Counseling serves as a national leader in the professional preparation of licensed professional counselors and certified rehabilitation counselors who will exercise skill and competence on a high technical and ethical level. Department faculty conduct active programs of research and service and maintain high levels of teaching competence. In partnership with students, community agencies and consumer and professional organizations, the department endeavors to enhance the personal, social and economic well-being of the clients they serve, regardless of disability or other life circumstances.

The Department of Rehabilitation Counseling is fully accredited by the Council on Rehabilitation Education, and is the only such program in the commonwealth of Virginia. The purpose of accreditation is to promote the effective delivery of rehabilitation services to people with disabilities by fostering ongoing review and improvements of rehabilitation education programs. CORE has developed a field-based research accreditation process that has gained widespread acceptance in the professional accreditation movement. With more than 2,000 alumni, the department also enjoys solid relationships with many community organizations that serve as excellent sites for clinical training.

Faculty adviser

Every student must have a faculty adviser to guide the student regarding course selection and scheduling, to supervise his/her research and

to act as a channel of communication with the department, to other departments and to the Graduate School. When the student receives notification of admission to the department, it is his/her responsibility to contact the faculty adviser to plan the program of study. Students consult with faculty advisers on a regular basis to ensure orderly progress through the entire program of study, choose clinical placement sites, select electives and plan their careers.

- Rehabilitation and Mental Health Counseling, Master of Science (M.S.) (p. 208)
- Rehabilitation Counseling, Master of Science (M.S.)/Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined] (p. 211)
- Professional Counseling, Certificate in (Post-master's certificate) (p. 207)

Professional Counseling, Certificate in (Post-master's certificate)

Program goals

The post-master's certificate program in professional counseling is designed for persons who hold the Master of Science or Master of Arts degree in counseling from VCU or other accredited institutions. The intent is to assist students in meeting the educational requirements for the Licensed Professional Counselor, the Licensed Substance Abuse Practitioner and the Certified Substance Abuse Counselor credentials in Virginia and other states.

The certificate program also may be pursued to fulfill preservice or continuing education requirements for various national certifications, such as National Certified Counselor or Certified Rehabilitation Counselor. Specialization requirements may exceed the minimum number of required credit hours for the certificate program as a whole.

Courses are selected from course offerings of the Master of Science in Rehabilitation Counseling program based on individualized need and in conjunction with a faculty adviser.

Specific goals include but are not limited to:

1. The encouragement of advanced graduate education in counseling
2. The facilitation of the professional counselor's career development efforts and goals
3. The facilitation of the acquisition or maintenance of professional state licenses or national certificates
4. The expansion of the student's awareness and expertise in specialized counselor roles and functions

Student learning outcomes

Upon completion of the program, the graduate will be able to:

1. Develop and maintain confidential counseling relationships with individuals using established skills and techniques
2. Establish, in collaboration with the consumer, individual counseling goals and objectives
3. Apply advanced counseling and interviewing skills
4. Employ consultation skills with and on behalf of the consumer

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Post-master's certificate	Fall	Apr 1	
	Spring	Oct 1	

Special requirements

- Statement of academic and professional goals and of previous work or volunteer experience
- Three letters of reference from professors, employers or others who can assess applicant's capabilities (nonfamily members)
- Personal interview (may be required)

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have completed a master's degree in rehabilitation counseling or a related discipline.

Upon admission to the program, students must meet with an academic adviser to design an approved course of study that leads to the completion of the educational requirements for licensure or certification as a professional counselor.

Degree requirements

In addition to general Graduate School graduation requirements (p. 31),

1. Students must complete a minimum of 15 graduate credit hours of course work in professional counseling that leads to the completion of the educational requirements for licensure or certification as a professional counselor, as prescribed in their approved courses of study. Specialization requirements may exceed the minimum number of required credit hours for the certificate program as a whole.
2. Students must maintain an overall minimum grade point average of 3.0.
3. The 15 graduate credit hours must not duplicate previous graduate course work completed at VCU or other institutions.
4. The 15 graduate credit hours must include six graduate credit hours in advanced counseling skills.
5. Transfer credits are not accepted.

Curriculum requirements

Upon admission to the program, students must meet with an academic adviser to design an approved course of study that leads to the completion of the educational requirements for licensure or certification as a professional counselor. Each plan of study is individualized, but may include courses from the following list, if approved by the faculty adviser.

Licensed Professional Counselor credential

Course	Title	Hours
RHAB 613	Advanced Rehabilitation Counseling Seminar (three-credit course; may be repeated for a total of nine credit hours) [1,2]	9
RHAB 614	Counseling, Death and Loss [2]	3
RHAB 615	Human Growth and Development	3
Total Hours		15

[1]

Possible topics: cognitive behavioral therapy; crisis counseling, etc.

[2]

Courses that may satisfy the six graduate credit hours in advanced counseling skills requirement.

Total graduate credit hours required (minimum) 15

Certified Rehabilitation Counselor credential

Course	Title	Hours
Select five of the following:		15
RHAB 525	Introduction to Rehabilitation Counseling	
RHAB 611	Theories of Professional Counseling	
RHAB 623	Career Counseling and Job Placement	
RHAB 624	Assessment and Evaluation	
RHAB 640	Medical and Psychosocial Aspects of Disabilities	
RHAB 633	Case Management	
RHAB 654	Multicultural Counseling	
RHAB 691	Counseling Techniques	
Total Hours		15

Total graduate credit hours required (minimum) 15

Licensure requirements

Refer to the Department of Rehabilitation Counseling website for additional information on Licensed Professional Counselor (http://www.sahp.vcu.edu/rehab/current/lpc.html) and the Commission on Rehabilitation Counselor Certification website (http://www.crccertification.com/pages/aboutcertification/46.php) for Certified Rehabilitation Counselor examination requirements.

Graduate program director
Amy J. Armstrong, Ph.D.
Associate professor and chair, Department of Rehabilitation Counseling
Email: ajarmstro@vcu.edu
Phone: (804) 827-0913

Program website: sahp.vcu.edu/departments/rehab/programs/advanced-certificate-in-professional-counseling (http://sahp.vcu.edu/departments/rehab/programs/advanced-certificate-in-professional-counseling)

Rehabilitation and Mental Health Counseling, Master of Science (M.S.)

Program accreditation
Council on Rehabilitation Education

Department goals

- To provide students with educational experiences that facilitate the development of knowledge, skills and values necessary to practice as a licensed professional counselor and certified rehabilitation counselor
- To provide students with learning opportunities that foster culturally responsive and ethical counseling practices

- To provide students with clinical training environments that prepare them to work in a variety of counseling settings

Program objectives

- Develop a well-rounded education in rehabilitation and mental health counseling
- Advance the basic philosophical tenets of rehabilitation, including the value and worth of all individuals, a belief in human dignity, and the right of all persons to fully participate in society
- Exercise skills and competencies on a high ethical level and with personal integrity
- Acquire a comprehensive understanding of the personal, social, vocational and psychological needs of persons with disabilities

Student learning outcomes

Upon completion of the program, the graduate will be able to:

- Demonstrate the ability to function ethically and effectively within settings that offer counseling, advocacy and related services to diverse populations
- Understand a range of counseling theories and skills applicable in a pluralistic society with individuals, groups, couples and families, as well as demonstrate the ability to apply this knowledge in a therapeutic manner to promote change and growth.
- Understand and apply the stages of development throughout the lifespan, including developmental goals, when working with individuals, regardless of disability or other impairing conditions
- Understand and apply career development theory and tools
- Demonstrate the ability to apply case management techniques with an understanding of the range of community resources available
- Demonstrate the appropriate use of assessment techniques when working with individuals and utilize relevant information within the counseling process
- Demonstrate the ability to evaluate professional research literature and incorporate such information into their professional development
- Demonstrate the knowledge and skills necessary to be an effective professional counselor through supervised practicum and internship experience

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Other information

A student handbook is made available to students through a closed electronic system (Blackboard) and at new student orientation.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE or MAT

Special requirements

- Full- and part-time students can be accommodated by the program. Applications are reviewed on an ongoing basis. To be considered, all pertinent materials must be received in the department by March 1.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

- Satisfactory performance in undergraduate education (based upon transcripts provided to Graduate Admissions)
- Three positive letters of reference from professors, employers or relevant sources
- Satisfactory performance on either the GRE or the MAT
- A relevant and clear statement of goals for graduate study and career
- Statement of previous work or volunteer experience

A personal interview with a faculty member may also be required.

A complete set of application materials is available from the Graduate Admissions website (http://www.graduate.admissions.vcu.edu).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the minimum degree requirement is 60 graduate credits, including 48 credits of didactic course work, 100 hours of fieldwork, 600 hours of internship and three credits of electives.

Graduates from accredited rehabilitation counseling programs are typically trained in counseling theory and techniques; individual, group and environmental assessment; psychosocial and medical aspects of disability; human development; cultural diversity; principles of psychiatric rehabilitation, case management and rehabilitation planning; issues and ethics in rehabilitation service delivery; technological adaptation; vocational evaluation and work adjustment; career counseling; implementation of the Americans with Disabilities Act; job development; and placement.

According to CORE Standards and the requirements of the department, students must have supervised rehabilitation and mental health counseling fieldwork and internship experiences that include:

- A minimum of 100 clock hours of fieldwork experience (as part of RHAB 692)
- A minimum of 600 clock hours of internship experience in rehabilitation and mental health settings (as part of RHAB 695 or RHAB 696)
- Written expectations and procedures for these experiences that are distributed to students and agency supervisors
- The following activities:
  - Orientation to program components, policies and procedures
  - Introduction to staff and their roles and functions
  - Identification of the expectations for students
  - Observation of all aspects of the delivery of rehabilitation and mental health counseling services
  - Work assignments performing the tasks required of an employed rehabilitation and mental health counselor in a rehabilitation and mental health setting from intake to discharge and/or placement
  - Reporting, including all required academic reports as well as logs, weekly progress reviews and summaries of activities
- Evaluation of student performance by the agency supervisor and the faculty supervisor, including self-evaluation by the student

Internship experiences shall be carried out under the regularly scheduled supervision of a CRC and LPC. The quality of supervision shall be maintained by involvement of VCU faculty in terms of in-service training, consultation, information and the provision of professional development resources to agency supervisors.

Transfer credit

A maximum of 12 graduate credit hours may be transferred from another VCU graduate program or outside institution if not applied previously to another degree. Transfer credit hours must carry a minimum grade of B from an accredited institution. Acceptance of transfer credit hours is made at the level of the department chair and dean of the College of Health Professions. Transfer credit hours earned as a nondegree-seeking graduate student are limited to six credit hours. Credit hours earned as deficiency hours or to demonstrate the ability to compete at the graduate level, though transferable, may not be applied to the 48-credit-hour program of study.

Curriculum requirements

Course	Title	Hours
RHAB 521	Addiction Counseling	3
RHAB 525	Introduction to Rehabilitation Counseling	3
RHAB 526	Introduction to Mental Health Counseling	3
RHAB 611	Theories of Professional Counseling	3
RHAB 612	Group Counseling Theories and Techniques	3
RHAB 615	Human Growth and Development	3
RHAB 616	Couples and Family Counseling	3
RHAB 623	Career Counseling and Job Placement	3
RHAB 624	Assessment and Evaluation	3
RHAB 625	Research and Program Evaluation	3
RHAB 633	Case Management	3
RHAB 640	Medical and Psychosocial Aspects of Disabilities	3
RHAB 642	Diagnosis and Treatment of Mental Health Disorders	3
RHAB 654	Multicultural Counseling	3
RHAB 691	Counseling Techniques	3
RHAB 692	Advanced Professional Issues in Counseling (includes 100-hour practicum)	3
Select one of the following: [1]		9
RHAB 695	Supervised Clinical Practice in Substance Abuse Rehabilitation	
RHAB 696	Supervised Clinical Practice in Rehabilitation and Mental Health	
Elective		3
Total Hours		60

[1] Includes 600 hours of internship and may be spread across two semesters as shown below in example plan of study.

Total graduate credit hours required (minimum) 60

Example of a full-time plan of study

Semester 1		Hours
RHAB 526	Introduction to Mental Health Counseling	3
RHAB 611	Theories of Professional Counseling	3
RHAB 623	Career Counseling and Job Placement	3
RHAB 691	Counseling Techniques	3
	Term Hours:	12
Semester 2		
RHAB 525	Introduction to Rehabilitation Counseling	3
RHAB 624	Assessment and Evaluation	3
RHAB 642	Diagnosis and Treatment of Mental Health Disorders	3

RHAB 692	Advanced Professional Issues in Counseling (includes 100-hour practicum)	3
	Term Hours:	12
Semester 3		
RHAB 521	Addiction Counseling	3
RHAB 633	Case Management	3
	Term Hours:	6
Semester 4		
RHAB 612	Group Counseling Theories and Techniques	3
RHAB 625	Research and Program Evaluation	3
RHAB 640	Medical and Psychosocial Aspects of Disabilities	3
RHAB 695 or RHAB 696	Supervised Clinical Practice in Substance Abuse Rehabilitation or Supervised Clinical Practice in Rehabilitation and Mental Health	3
	Term Hours:	12
Semester 5		
RHAB 616	Couples and Family Counseling	3
RHAB 654	Multicultural Counseling	3
RHAB 695 or RHAB 696	Supervised Clinical Practice in Substance Abuse Rehabilitation or Supervised Clinical Practice in Rehabilitation and Mental Health	6
	Term Hours:	12
Semester 6		
RHAB 615	Human Growth and Development	3
Elective		3
	Term Hours:	6
	Total Hours:	60

Note that semesters three and six are completed during the summer.

Graduate program director
Amy J. Armstrong, Ph.D.
Associate professor and chair, Department of Rehabilitation Counseling
Email: ajarmstr@vcu.edu
Phone: (804) 827-0913

Additional contact:
Christopher C. Wagner, Ph.D.
Associate professor and vice chair
Email: ccwagner@vcu.edu
Phone: (804) 827-0916

Program website: sahp.vcu.edu/rehab (http://www.sahp.vcu.edu/rehab)

Rehabilitation Counseling, Master of Science (M.S.)/Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined]

The Department of Gerontology, in cooperation with other programs at the university, provides students interested in working with elders or in gerontological settings with the opportunity to complete the Certificate in Aging Studies while also completing requirements for other degree programs. Students must apply separately to the participating programs and must meet all admission and degree requirements for both programs. In some cases, and with the approval of the advisers of both programs, course work in one program may be approved to satisfy a course requirement in another program.

The Department of Rehabilitation Counseling, in cooperation with the Department of Gerontology, provides its degree-seeking students with the opportunity to earn the Certificate in Aging Studies while concurrently completing the requirements for the Master of Science in Rehabilitation Counseling.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Students must meet admission requirements for both the rehabilitation counseling degree and the aging studies certificate program, and admission into one is independent of the other.

Curriculum requirements

Course	Title	Hours
GRTY 601	Biological and Physiological Aging	3
GRTY/PSYC 602	Psychology of Aging	3
GRTY 603	Social Gerontology	3
GRTY 615 or GRTY 641	Aging and Mental Disorders Survey of Psychological Assessment and Treatment of the Older Adult	3
GRTY 692	Independent Studies	3
RHAB 625	Research and Program Evaluation	3
RHAB 696	Supervised Clinical Practice in Rehabilitation and Mental Health	3
Total Hours		21

Total graduate credit hours required (minimum) 21

Contact the respective departments for additional curriculum information.

Graduate program director
Jennifer Pryor
Department of Gerontology
Email: pryorjm@vcu.edu
Phone: (804) 828-1565

Program website: chp.vcu.edu/gerontology (https://chp.vcu.edu/departments/gerontology)

Virginia Center on Aging

The Virginia Center on Aging, established at VCU by the Virginia General Assembly in 1978, is a statewide resource for aging-related research, education, service, training and technical assistance. It serves as a focal point for the collection, assessment and maintenance of data on elders in the commonwealth; designs and tests innovative demonstration projects in education and service delivery; and assists public and private organizations in meeting the needs of older citizens.

The Virginia Center on Aging and the Department of Gerontology maintain the Information Resources Center, a broad collection of print and audiovisual materials on aging that is available on loan. Short reports and training manuals may be obtained at cost. The Virginia Center on Aging also administers the Alzheimer's and Related Diseases Research Award Fund that provides seed grants of $25,000 each to researchers in Virginia

in order to investigate biomedical, psychosocial, clinical, public policy and other aspects of dementing illness.

The Virginia Center on Aging regularly partners with other units of VCU in developing, conducting and evaluating research and training projects related to aging, disabilities, lifelong learning and health problems. The center is located in the Theater Row building at 730 E. Broad St.

COLLEGE OF HUMANITIES AND SCIENCES

The faculty and staff of the College of Humanities and Sciences are dedicated to excellence in teaching, research and public service. The mission of Virginia Commonwealth University provides the framework for this pursuit of excellence.

Teaching and learning are central to the college, and the college is central to educational and intellectual life at VCU. The college meets the educational needs of a diverse student body, provides general education for all undergraduate students of the university, preparatory programs for the health sciences, engineering and law, and educates future teachers in the liberal arts and sciences. The college offers comprehensive undergraduate, graduate and professional programs of study that link a foundation of understanding and knowledge with skills on which students can build careers, become responsible citizens and continue lifelong learning.

Scholarship, creative work and professional accomplishment are essential to teaching and learning. The college is responsible for advancing understanding and increasing knowledge for its own sake, for the educational benefit of its students, and for the good of the larger community.

In both teaching and research, the College of Humanities and Sciences seriously upholds the responsibilities of being part of a public, metropolitan university. Through service and public teaching, the college meets the challenges and opportunities afforded by VCU's urban environment and by its location in the capital of the commonwealth.

The college achieves national and international recognition through the success of its students, the advancement of the disciplines and professions represented by its programs, and through the individual and collaborative research of its faculty.

Administration

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Montserrat Fuentes, Ph.D.
Professor and dean

Edmund Acevedo, Ph.D.
Professor and associate dean of graduate studies and strategic initiatives

Deirdre Condit, Ph.D.
Associate professor and associate dean of faculty affairs

Joshua Langberg, Ph.D.
Associate professor and associate dean of research

James Mays, Ph.D.
Associate professor and associate dean for undergraduate academic affairs

Don Young, Ph.D.
Professor and senior associate dean of finance and administration

Accreditation

Chemistry (bachelor's degree)

The American Chemical Society

Forensic science (bachelor's and master's degrees)

Forensic Science Education Programs Accreditation Commission

Mass communications (bachelor's degrees in the Richard T. Robertson School of Media and Culture)

Accrediting Council on Education in Journalism and Mass Communications

Psychology (doctoral degrees: clinical, counseling)

American Psychological Association

Graduate information

Graduate programs

The College of Humanities and Sciences offers the following graduate degree programs:

Biology, M.S.
Chemical Biology, Ph.D.
Chemistry, M.S. and Ph.D.
Clinical Psychology, Ph.D.
Counseling Psychology, Ph.D.
Creative Writing, M.F.A.
English, M.A.
Forensic Science, M.S.
Health and Movement Science, M.S.
Health Psychology, Ph.D.
History, M.A.
Integrative Life Sciences, Ph.D.
Interdisciplinary Studies, M.I.S.
Mass Communications, M.S. (through the Robertson School of Media and Culture)
Mathematical Sciences, M.S.
Media, Art, and Text, Ph.D.
Nanoscience and Nanotechnology, Ph.D.
Physics and Applied Physics, M.S.
Psychology, M.S. and Ph.D.
Rehabilitation and Movement Science, Ph.D.
Sociology, M.S.
Systems Modeling and Analysis, Ph.D.

Post-baccalaureate certificates
Applied Social Research (graduate)
Gender, Sexuality and Women's Studies (graduate)

In addition to these degree programs, the College of Humanities and Sciences offers selected graduate courses in the Department of Philosophy and the School of World Studies (foreign languages and

religious studies), but does not offer graduate degree programs in these areas.

Graduate admission requirements

In addition to the general requirements for admission to graduate studies as stated in the Graduate study (p. 33) section of this bulletin, persons seeking admission to any of the graduate programs in humanities and sciences should:

- Have a bachelor's degree in the discipline in which application for graduate study is made or, in some programs as noted, a bachelor's degree in some other appropriate area
- Submit Graduate Record Examination scores (some departments require the scores on the advanced GRE within the discipline; some departments accept LSAT and MAT scores in lieu of GREs)
- Have submitted letters of recommendation that comment on the applicant's ability to undertake graduate study in the specified area

All applications will be considered in terms of the specific requirements for admission noted in the description of the individual programs and of the applicant's ability to perform satisfactorily in the program for which he/she has applied. The judgment of that ability will be based on the supporting material submitted with the application. Some graduate programs must limit enrollment to a fixed number of the best-qualified applicants. Final action on admission is taken by the dean of the Graduate School in consultation with the College of Humanities and Sciences and the program concerned.

Applicants whose applications reach the university after July 1 for the fall semester and after Nov. 15 for the spring semester may not have their applications processed in time for registration. The applicant whose application arrives late may be considered for admission as a special student, but there is no guarantee that the special student later will be accepted into a degree program.

Graduate registration

Although most students register for the fall semester, which begins in August, they may arrange to begin graduate work during the spring semester with the exception of the programs in clinical and counseling psychology.

Scholarships, assistantships, fellowships and other financial assistance for graduate students

The College of Humanities and Sciences seeks to attract and support graduate students of the highest caliber and to prepare them, through research and instruction, to meet local and national needs for highly trained men and women. Recognizing that financial limitations may inhibit some qualified students from applying, the college attempts to inform students of the options of various loans, grants and work-study opportunities that are available to them as well as assist them in financing their education by offering various forms of financial aid and facilitating the process of seeking financial assistance from external sources. Additionally, the college believes that the experience of being a teaching or research assistant reinforces the learning that takes place in the classroom. The value of teaching assistants also is recognized as being beneficial to the college's undergraduate programs.

Types of financial aid that are available to graduate students fall into three basic categories: aid that does not have to be repaid (grants, scholarships and tuition waivers), aid that does have to be repaid (loans) and aid that enables students to earn a portion of their school costs (work-study, graduate teaching assistantships and graduate research assistantships).

Offers of financial aid are based on financial need and/or skill and competency. Financial need is determined by information contained in the Federal Application for Student Aid completed by the student. Not all financial aid is based on financial need. To ascertain your eligibility for the different types of financial aid, contact:

VCU Office of Financial Aid
901 W. Franklin St.
Box 843026
Richmond, VA 23284-3026
(804) 828-6669
and the department to which you will be applying.

The university library has reference books listing other types of scholarships and grants. International students should contact:

Global Education Office
916 W. Franklin St.
Box 843043
Richmond, VA 23284-3043
(804) 828-6016

Graduate teaching assistantships and graduate research assistantships are forms of financial aid that provide teaching and research positions for graduate students within their field of study. These are not loans and do not have to be repaid because the student is actually earning income for services rendered. Usually graduate assistants must work the equivalent of 20 hours per week. Assistantships are awarded to students who have demonstrated academic excellence. Individual departments award the assistantships, which usually include payment of tuition; the teaching and/or research duties of graduate assistants vary among departments. Graduate students interested in seeking these teaching and research positions are advised to contact the departments to which they will apply for admission.

Graduate students applying for financial assistance should remember the following tips:

- Apply early
- Use federal tax forms to complete the FAFSA
- Save copies of all forms completed, including tax returns
- Check with the specific department for application requirements and deadlines

Students should assume they are eligible, not ineligible.

The student adviser and the graduate committee

All departments offering graduate degrees in the College of Humanities and Sciences provide graduate students with advising either through a single adviser, the student's graduate committee or a departmental graduate committee. For details, students should consult the departmental director of graduate studies or the department chair.

Graduate degree requirements

- Full-time graduate status shall consist of a minimum of nine and a maximum of 15 credits per semester. No more than 12 semester credits may be earned in a summer session. See the Graduate study

(p. 33) section of this bulletin for course load requirements for students awarded graduate assistantships.

- Graduate students are required to maintain an overall GPA of 3.0 (B). Students who do not maintain a B average during the course of their program may be dropped from the program at any time on recommendation of the appropriate department committee to the dean of the Graduate School. If students earn less than a B on 20 percent or more of all attempted credits, their graduate status must be reviewed for continuation by the appropriate department committee.
- At least half of the credits required in the student's program must be those designated as exclusively for graduate students; that is, those at the 600 level or above.
- Graduate students must have earned an overall GPA of 3.0 (B) in order to receive a degree.

In addition to these requirements and those set forth in the Graduate study (p. 33) section of this bulletin, students must meet the requirements for specific degrees set forth in the departmental listings. Students also should consult the continuous enrollment policy stated in the Graduate study (p. 33) section of this bulletin.

VCU requires registration for a defined credit-hour level during both the didactic and research phases of advanced degree training. For programs requiring the preparation of a thesis or dissertation, there is no obligatory linkage between the accumulation of credit hours and an expectation that a degree be awarded.

As a guide to monitoring the timely completion of the degree requiring a thesis or dissertation within the present enrollment framework, the accumulation of 80 credit hours for a master's degree and 180 credit hours for a doctoral degree can be taken to be reasonable credit maxima. Unless stated otherwise, these figures apply only to programs offered by the College of Humanities and Sciences.

Students are required to submit in advance of the date when they expect to receive a degree a graduation application form to the dean of the College of Humanities and Sciences. Deadlines for the submission of the graduation application form are listed in the academic calendars (http://academiccalendars.vcu.edu); for departmental deadlines the student should consult the departmental adviser. Individual departments may require additional forms.

Appeal procedures

Graduate students in the College of Humanities and Sciences have the right to appeal course grades or other academic actions on the grounds of a breach of due process. See the Graduate study (p. 33) section of this bulletin for a summary of the grade review procedure. An appeal of an academic action other than a grade review is governed by the graduate student academic appeal procedure. A copy of this document can be obtained from department offices.

Richard T. Robertson School of Media and Culture

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Hong Cheng, Ph.D.
Professor and director

Peyton Rowe
Associate professor and director of undergraduate studies

June Nicholson
Professor and director of graduate studies

Natasha Long
Coordinator of student services

The Robertson School of Media and Culture prepares effective and skilled communicators through quality instruction, advising and student services, based on real-world applications. Through research, professional service and scholarship in applied communications, the school advances the knowledge and practice of a multidisciplinary and evolving media environment. The school values truth, ethics, creativity, innovation, collaboration, cultural diversity, shared governance and community engagement.

The school offers a Bachelor of Science in Mass Communications with specialization in one of three concentrations: advertising, journalism and public relations. The school also awards the Master of Science in Mass Communications, with concentrations in the areas of integrated PR and advertising, multimedia journalism, and strategic public relations.

Graduate information

Admission requirements for graduate study

All areas are open to graduates of accredited colleges and universities. Applicants must satisfy the general requirements for admission to graduate programs in the Graduate School and the College of Humanities and Sciences (see the College of Humanities and Sciences guidelines in this bulletin). In addition, they should hold a baccalaureate degree in an area appropriate to the program to which they are applying and a GPA that indicates the ability to pursue graduate work. Although the type of undergraduate degree is not critical to admission, the programs require approved undergraduate curricula or the equivalent in order to grant full admission.

- Mass Communications, Master of Science (M.S.) with a concentration in integrated public relations and advertising with Fudan University [dual degree] (p. 215)
- Mass Communications, Master of Science (M.S.) with a concentration in multimedia journalism (p. 217)
- Mass Communications, Master of Science (M.S.) with a concentration in strategic public relations (p. 219)
- Media, Art, and Text, Doctor of Philosophy (Ph.D.) (p. 220)

Mass Communications, Master of Science (M.S.) with a concentration in integrated public relations and advertising with Fudan University [dual degree]

Program goals

The Richard T. Robertson School of Media and Culture prepares effective and skilled communicators through quality instruction, advising and student services, based on real-world applications. Through research,

professional service and scholarship in applied communications, the school advances the knowledge and practice of a multidisciplinary and evolving media environment. The school values truth, ethics, creativity, innovation, collaboration, cultural diversity, shared governance and community engagement.

The M.S. in Mass Communications with a concentration in integrated public relations and advertising is offered in collaboration with Fudan University in Shanghai, one of VCU's 16 recognized international partners, and VCU's Richard T. Robertson School of Media and Culture. It is designed to educate Chinese students for the practice, in China, of professional public relations and/or advertising. Because in many agencies and organizations public relations and advertising are integrated, we are integrating the two professional disciplines in one degree program. The program is for Chinese students who have undergraduate degrees from a Chinese institution and who are already working or aspire to work in China for a public relations or advertising agency or an agency that combines the two persuasive communication disciplines. It is also open to students in the U.S. with the same undergraduate education and a desire to work in an internationally active public relations or advertising agency that does business in Asia/China. The program will prepare its students to function at a higher professional level than they can attain with their current academic and professional credentials.

Student learning outcomes

1. Demonstrate higher-level skills of the public relations management function, including strategy development and critical thinking
2. Communicate clearly and effectively in written and spoken forms appropriate for strategic public relations practice, audiences and the purposes they serve
3. Demonstrate ability to conduct research and evaluation to support strategic public relations decision-making
4. Effectively apply tools and technologies appropriate to managing the process for strategic public relations

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The mass communications graduate handbook is available on the Robertson School website at robertson.vcu.edu/about/advising/handbooks-and-worksheets (http://robertson.vcu.edu/about/advising/handbooks-and-worksheets).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Spring	Jan 15 (preferred consideration)	GRE-general
		Mar 15	TOEFL (International students only)

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Pass the entrance examination for postgraduate studies in the School of Journalism at Fudan University
2. Attain a qualified English proficiency level (i.e., greater than 600 for TOEFL or equivalent for iBT test)
3. Attain a GRE general test level of more than 1050 with no less than 500 for verbal (or equivalent for revised GRE)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

The dual degree program generally takes three academic years. The first three semesters are typically completed at Fudan. Students will continue their studies in VCU's Richard T. Robertson School of Media and Culture for three semesters (second semester and summer of the second academic year and fall semester of the third academic year). Students return to Fudan for the final semester.

1. Credit hour requirements: This degree requires a minimum of 31 credit hours beyond the baccalaureate, of which 18 credit hours are from VCU and 13 credit hours — preparatory foundation courses and thesis supervision — are taken at Fudan University's School of Journalism. At least one-half of the credit hours presented for graduation must be at the 600 level or higher. Upon completion of all requirements, students in this dual master's degree program will receive both the M.S. in Mass Communications from VCU and the Master of Literature from Fudan University.
2. Other requirements: All students are required to demonstrate proficiency in a suite of software programs commonly used by public relations and advertising practitioners before enrolling in their first VCU course.

Curriculum requirements

Course	Title	Hours
Course requirements: Fudan University [1]		
JOUR 6003	Research Methods of Communication	2
JOUR 6005	Media Management	2
JOUR 6007	Marxist Journalistic Ideology	2
JOUR 6008	Research on Journalistic History and Theory	2
Select five credit hours of recommend electives (Fudan University) of the list below		5
Thesis taken at Fudan University		
Course requirements: Virginia Commonwealth University		
MASC 671	Strategic PR in a Digital Environment	3
MASC 672	Strategic PR Research and Evaluation	3
MASC 675	Strategic PR Management	3
MASC 682	Strategic Media Relations	3
MASC 683	Strategic PR in the Global Environment	3
MASC 695	Fieldwork/Internship (elective course)	1-3
Total Hours		31

Recommended electives (Fudan University)

Course	Title	Hours
JOUR 6009	Journalistic Practice	3
JOUR 6010	The History of China's Journalism Thoughts	3
JOUR 6011	The Study of Communication	3
JOUR 6012	Cyber Communication	3
JOUR 6013	Marketing Communication	3
JOUR 6014	Consumer Behavior	3
JOUR 6015	The Study of PR	3
JOUR 6016	The Study of Current Publishing	3
JOUR 6017	The Study of Current Newspapers	3

Total graduate credit hours required (minimum) 31

Graduate program director
June O. Nicholson
Professor and director of graduate studies, Richard T. Robertson School of Media and Culture
jnichols@vcu.edu
(804) 827-0251

Program website: robertson.vcu.edu (http://www.Robertson.vcu.edu)

Mass Communications, Master of Science (M.S.) with a concentration in multimedia journalism

Program goals

The Richard T. Robertson School of Media and Culture prepares effective and skilled communicators through quality instruction, advising and student services, based on real-world applications. Through research, professional service and scholarship in applied communications, the school advances the knowledge and practice of a multidisciplinary and evolving media environment. The school values truth, ethics, creativity, innovation, collaboration, cultural diversity, shared governance and community engagement.

The M.S. in Mass Communications with a concentration in multimedia journalism is designed to prepare students to work in a highly competitive and multiple-platform (print, broadcast, online/digital) news environment. The program is for recent graduates who have an undergraduate degree in journalism or a related field, or for more veteran journalists who want to upgrade their professional skills.

Student learning outcomes

1. Demonstrate higher-level skills in concept building with a focus on critical thinking, and in the design of journalism news stories and packages with a multimedia focus
2. Communicate clearly and effectively in written and multimedia platforms to serve news audiences
3. Demonstrate the ability to conduct basic research that is applicable to journalism and multimedia
4. Effectively apply tools and technologies to multimedia news stories and packages as appropriate for the news industry and other communication workplaces

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate

School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The mass communications graduate handbook is available on the Robertson School website at robertson.vcu.edu/about/advising/handbooks-and-worksheets (http://robertson.vcu.edu/about/advising/handbooks-and-worksheets).

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE - General
	Spring	Nov 1	

Admission note: The school may admit other student candidates who submit materials beyond the review deadlines, depending on available space.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. An undergraduate degree in journalism or a related field or several years of professional journalism experience
2. An undergraduate GPA that exceeds 2.7 overall
3. A GRE (general test) score that indicates the ability to pursue graduate work
4. A detailed CV showing work experience in journalism or appropriate educational credentials
5. Three recommendations from persons who are qualified to give information concerning the applicant's ability for the specific program of study proposed
6. A personal statement detailing specific journalism career goals
7. A portfolio of work in journalism

Students who have not completed baccalaureate course work in journalism or who have not had the appropriate professional experience may be required to take undergraduate courses as a foundation. These do not count toward the graduate degree.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: This degree requires 36 credit hours beyond the baccalaureate, 30 of which are in the journalism discipline. Students take an additional six credit hours in a collateral area outside of mass communications. Students in this program learn the theory and practice of journalism in an immersion news environment and can further specialize through graduate electives, projects and stories in any number of "beat" areas. For example, students can focus on coverage of health or the environment or concentrate on learning about international media coverage. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other: The program is designed so that students will take three courses each semester (fall and spring). During each semester, two of the courses will be offered in the evenings and one will be offered online. Thus, students will be able to complete the course work over two years of study.

Curriculum requirements

Course	Title	Hours
Course requirements		
MASC 611	Research Methods in Mass Communications	3
MASC 642	Online Journalism I	3
MASC 643	Online Journalism II	3
MASC 644	Computer-assisted Reporting	3
MASC 645	Visual Journalism	3
MASC 646	Convergence Law and Ethics	3
MASC 684	Multiplatform Storytelling	3
MASC 685	The Business of Media	3
MASC 686	International Journalism	3
MASC 688	Converged Media Applications	3
Select six credit hours from the following electives: [1]		6
MASC 692	Independent Study	
MASC 695	Fieldwork/Internship	

ADLT (600-level)	
CRJS (600-level)	
ECON (600-level)	
EDUS (600-level)	
ENGL (600-level)	
ENVS (600-level)	
HSEP (600-level)	
INFO (600-level)	
MKTG (600-level)	
MSTM (600-level)	
PADM (600-level)	
SLWK (600-level)	
SPTL (600-level)	
Total Hours	36

Total graduate credit hours required (minimum) 36

Graduate program director
June O. Nicholson
Professor and director of graduate studies, Richard T. Robertson School of Media and Culture
jnichols@vcu.edu
(804) 827-0251

Program website: robertson.vcu.edu (http://www.Robertson.vcu.edu)

Mass Communications, Master of Science (M.S.) with a concentration in strategic public relations

Program goals

The Richard T. Robertson School of Media and Culture prepares effective and skilled communicators through quality instruction, advising and student services, based on real-world applications. Through research, professional service and scholarship in applied communications, the school advances the knowledge and practice of a multidisciplinary and evolving media environment. The school values truth, ethics, creativity, innovation, collaboration, cultural diversity, shared governance and community engagement.

The M.S. in Mass Communications with a concentration in strategic public relations trains a new generation of communications professionals who are able to function in high-level management positions and apply sophisticated strategic thinking to accomplish organizational objectives.

Student learning outcomes

1. Demonstrate higher-level skills of the public relations management function, including strategy development and critical thinking
2. Communicate clearly and effectively in written and spoken forms appropriate for strategic public relations practice, audiences and the purposes they serve
3. Demonstrate ability to conduct research and evaluation to support strategic public relations decision-making
4. Effectively apply tools and technologies appropriate to managing the process for strategic public relations

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The mass communications graduate handbook is available on the Robertson School website at robertson.vcu.edu/about/advising/handbooks-and-worksheets (http://robertson.vcu.edu/about/advising/handbooks-and-worksheets).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Summer	Jan 15 (preferred consideration)	GRE-general
		Mar 15	

Note: The school may admit other student candidates who submit materials beyond the review deadlines, depending on available space.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A current resume
2. Portfolio material from undergraduate and/or graduate course work and/or professional experience
3. An academic background in public relations (university or professional accreditation program) and appropriate public relations experience

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: This degree requires 30 credit hours beyond the baccalaureate, including six hours of approved elective courses in areas such as nonprofit management and marketing. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other: Students take weekend classes (Friday evenings and all day Saturday) as a cohort over four semesters. Continued full-time public relations employment is encouraged during the program. In addition, one of the program's unique features is a two-week study abroad experience, an expectation of students while they are enrolled in the MASC 683 Strategic PR in a Global Environment. The study tour is led by a full-time faculty member. The cost of the study abroad program is not included in the program's tuition.

Curriculum requirements

Course	Title	Hours
Course requirements		
MASC 654	Organizational Communication	3
MASC 671	Strategic PR in a Digital Environment	3
MASC 672	Strategic PR Research and Evaluation	3
MASC 675	Strategic PR Management	3
MASC 676	Public Relations Ethics and Law	3
MASC 682	Strategic Media Relations	3
MASC 683	Strategic PR in the Global Environment (study abroad)	3
MASC 694	Strategic PR Campaign Design and Implementation	3
Electives		6
Select from the following recommended electives:		
ACCT 507	Fundamentals of Accounting	
ECON 500	Concepts in Economics	
FIRE 520	Financial Concepts of Management	
MGMT 540	Management Theory and Practice	
MGMT 641	Leading People and Organizations	
MGMT 655	Entrepreneurship	
MGMT 656	Best Practices in Leadership	
MGMT 691	Topics in Management (negotiations)	
MKTG 570	Concepts and Issues in Marketing	
MKTG 671	Marketing Management	
MKTG 672	Concepts in Consumer Behavior	
SCMA 524	Statistical Fundamentals for Business Management	
SCMA 530	Fundamentals of the Legal Environment of Business	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
June O. Nicholson
Professor and director of graduate studies, Richard T. Robertson School of Media and Culture
jnichols@vcu.edu
(804) 827-0251

Program website: robertson.vcu.edu (http://www.Robertson.vcu.edu)

Media, Art, and Text, Doctor of Philosophy (Ph.D.) [Robertson School]

Program goal

VCU's interdisciplinary doctoral program in media, art, and text is a joint endeavor of the Department of English, the School of the Arts and the Richard T. Robertson School of Media and Culture. The program prepares students primarily to teach at the college or university level, although some pursue careers in related media fields. MATX emphasizes the historical and theoretical foundations essential to the scholarly study of media, both old and new, broadly defined. It provides an intellectually stimulating environment that encourages students to work both collaboratively and independently, as well as across and between disciplines and media. Students maintain a base in their primary area of research, which is usually but not always the field in which they have done prior graduate work.

Student learning outcomes

1. Develop advanced communication skills in writing, speaking and the use of multimedia
2. Demonstrate broad knowledge of history and theory as the foundation for interdisciplinary work in a specialized facet of media, art, and/or text
3. Develop competence in interdisciplinary and disciplinary research methods and responsible conduct of research
4. Develop specialized knowledge in relevant fields to support dissertation and subsequent research
5. Demonstrate the ability to conduct independent research and produce new, specialized knowledge within the broad parameters of media, art, and text
6. Develop a strong basis for ongoing professional practice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

The MATX student handbook is available at **matx.vcu.edu/program/handbook**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 2	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must hold a master's degree (M.A., M.F.A., M.S.) in a relevant field.
2. Applicants must submit the following, in the formats indicated via VCU's online application portal..
   a. Writing sample demonstrating the ability to write clearly, analyze effectively and conduct original research in advanced doctoral-level seminars – This may be a master's thesis, a graduate-level seminar paper or a published essay. Submit as a PDF.
   b. Statement of purpose describing the applicant's interest, motivation and goals in pursuing this degree – The statement should specifically address the importance of interdisciplinarity to the applicant's academic goals, and it should also offer evidence of preparation for the study of media, art, and text. The applicant should indicate the specific area of study and research to be pursued at VCU and identify faculty who might potentially direct dissertation research. Submit as a PDF.
   c. Academic curriculum vitae or professional resume – List all colleges and universities attended and degrees earned, all professional and academic positions held, all publications and/or exhibitions, technical skills, and any other relevant information. Include URLs for personal and/or professional websites. Submit as PDF.
   d. Letters of recommendation – Provide letters from three present or former instructors or other individuals qualified to evaluate the applicant's ability to engage in interdisciplinary study at the doctoral level. Have recommenders submit their letters via the online application portal.
3. Applicants who wish to pursue creative work at VCU must also submit a portfolio. Those with an M.F.A. who do not wish to continue creative work should consult with the MATX director about this requirement. Materials submitted should demonstrate excellence in studio or professional practice and the potential to do graduate-level work in media, art, and text. Portfolios will be reviewed by the MATX admissions committee as well as relevant faculty in the School of the Arts and the Richard T. Robertson School of Media and Culture. Please observe the following guidelines:
   a. Those working in 2-D or 3-D mediums should provide 20 images of representative work arranged chronologically, beginning with the most recent.
   b. Those working in sound and time-based media, as well as those in the performing arts, should provide clips totaling no more than 10 minutes.
   c. Those working across media may submit a combination of the above.
   d. The portfolio should include title, date, media and dimensions of each work, as well as a brief statement or other information that will help the admissions committee in its evaluation.

      Small files illustrating 2-D or 3-D work should be submitted in a single PDF. Sound or video files should be posted to Vimeo or Sound Cloud with a functioning link submitted in a PDF with the

required information posted to the portal. Portfolio materials may also be posted to a personal or professional website and the link submitted in a PDF posted to the portal.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the MATX program are required to earn a minimum of 42 graduate-level credit hours beyond the master's. At least one-half of the credit hours presented for graduation must be at the 600 level or higher. The 42-hour curriculum comprises 36 hours of course work and a minimum of six hours of dissertation research. Course work includes a core of four required courses taken during the first two semesters by all incoming students. Three doctoral seminars provide a shared historical and theoretical foundation for the study of media, art, and text, while a workshop offers the opportunity to develop and expand professional and/or creative skills relevant to the student's career goals and research focus. In addition, all students will take a research methods course in a field relevant to their anticipated area of dissertation research. Beyond the core, students select 21 hours of elective credit hours from course offerings in disciplines relevant to their research interests and career goals. The program offers a topics seminar focused on the history, theory or practice of media, art, and text. Independent study and internships are also available as electives. While enrollment in courses with the MATX prefix is guaranteed to matriculated MATX students, enrollment in other graduate courses is subject to the conditions established by individual units. Together the core and the electives support the interdisciplinary work of the dissertation, which is an original scholarly examination of some aspect of media, art, and/or text. It may include work in media other than text. It is supervised by a committee consisting of four or five members drawn from disciplines relevant to the research topic.
2. Grade requirements: To graduate, degree applicants must achieve an overall grade point average of 3.0 (B) on a 4.0 scale with a grade of C in no more than two courses. The GPA for graduation will be based on all graduate courses attempted after acceptance into the program.
3. Requirements for admission to candidacy: Before beginning formal dissertation research, students must complete all 36 hours of required course work, both stages of the e-portfolio and the requirements described below. Upon completion of these, the student will apply for degree candidacy.
4. Dissertation committee: The dissertation committee consists of the director (who must hold a Ph.D.) and three or four additional members whose scholarly knowledge and interests are relevant to the project. The committee must have at least one member from each of the sponsoring units (Department of English, School of the Arts, Richard T. Robertson School of Media and Culture). All must be members of VCU's graduate faculty. Appropriate faculty from outside VCU may serve on committees (but not as director) with the approval of the MATX director and the graduate dean. It is the student's responsibility to assemble the committee, in consultation with the dissertation director. Committees will not be appointed by the program.
5. E-portfolio: Work on the e-portfolio will begin in MATX 604 in the spring of the first year. There are no technical specifications, and content will include, but is not limited to, work done in the first two years in the program. It will take the form of a website and must demonstrate the technical skills (Web design, audio, video, etc.) relevant to the student's work on the dissertation and the career sought after VCU. Submission is a two-stage process:
   a. Stage 1 (August of the second year): a three- to five-page design rationale for the portfolio site along with a mock-up or rough structure
   b. Stage 2 (April of the second year): a finished, live site accompanied by a five-page statement relating it to the student's work inside and outside the program and outlining how it uses media techniques to promote a specific professional and/or creative identity (Note: Each submission is graded pass/fail and may be repeated once. A second failure results in automatic termination from the program.)
6. Competency: Candidates must demonstrate competency in a skill or technique relevant to the dissertation research or planned professional career. The dissertation committee approves and administers the competency portion. Graded pass/fail, the test may be repeated once.
7. Bibliography exam: Candidates will complete an exam on a reading list of 20 to 30 sources relevant to or supportive of the dissertation topic. The dissertation committee approves and administers the bibliography exam. Graded pass/fail, the test may be repeated once.
8. Dissertation prospectus and prospectus defense: The prospectus is a 15- to 20-page document that indicates the significance of the proposed research, gives a short review of relevant literature, states the research question, specifies the proposed methodology and indicates how the project lays the foundation for the anticipated academic or professional career. It also includes a work plan for the completion of research and writing, as well as a complete bibliography. The prospectus is defended orally before the dissertation committee, which may accept, reject or require revisions. The defense may be repeated once.
9. Dissertation and dissertation defense: The dissertation is an original, interdisciplinary and scholarly examination of a topic relevant to an aspect of media, art, and/or text. It may include work in media other than text. Given the varied nature of doctoral research, there is no set time frame for completion of a dissertation. It is expected, however, that the dissertation will take about two years after attaining candidacy, but it must be defended within the eight-year time limit for completion of the doctoral degree. The dissertation will be defended orally before the dissertation committee. Successful defense of the dissertation completes the requirements for the degree.

Curriculum requirements

Course	Title	Hours
MATX 601	Texts and Textuality	3
MATX 602	History of Media, Art, and Text	3
MATX 603	Mass Media	3
MATX 604	Interdisciplinary Workshop	3
MATX 897	Dissertation Project	6
Select one methods course from list 1 below		3
Select elective courses from list 2 below [1]		21
Total Hours		42

[1] Elective courses other than those listed may be taken with approval of the MATX program director and the offering department.

Total graduate credit hours required (minimum) 42

List 1: Methods courses

Course	Title	Hours
ARTH 690	Historiography and Methodology of Art History	3
ENGL 605	Introduction to Scholarship in English Studies	3
GSWS 602	Feminist Research Epistemology and Methods	3
MASC 611	Research Methods in Mass Communications	3

List 2: Recommended electives

Course	Title	Hours
ARTH 591	Special Topics in Art History	1-6
ARTH 690	Historiography and Methodology of Art History	3
ARTH 722	Seminar in 19th-century Art	3
ARTH 723	Seminar in 20th-century Art	3
ARTH 741	Seminar in Art and Theory	3
ARTH 742	Seminar in Trans-millennial Art and Ideas	3
ARTH 743	Seminar in Art and Representation	3
ARTH 791	Special Topics in Art History	3
ENGL 560	Studies in British Literature and Culture	3
ENGL 570	Special Topics in American Literature and Culture	3
ENGL 605	Introduction to Scholarship in English Studies	3
ENGL 611	Authors	3
ENGL 614	Cultural Discourses	3
ENGL 620	Intertextuality	3
ENGL 624	Texts and Contexts	3
ENGL 627	Genres	3
ENGL 629	Form and Theory of Poetry	3
ENGL 630	Form and Theory of Fiction	3
ENGL 631	Form and Theory of Creative Nonfiction	3
ENGL 661	Themes in Interdisciplinary Studies	3
GSWS 501	Feminist Theory	3
GSWS 602	Feminist Research Epistemology and Methods	3
GSWS 620	Theorizing Sexuality	3
GSWS 624	Gender and Cultural Production	3
GSWS 691	Topics in Gender, Sexuality and Women's Studies	1-3
KINE 591	Topics in Contemporary Media	3
KINE 690	Graduate Seminar	4
KINE 695	Advanced Sound	3
MASC 611	Research Methods in Mass Communications	3
MASC 645	Visual Journalism	3
MASC 684	Multiplatform Storytelling	3
MASC 688	Converged Media Applications	3
MASC 691	Topics in Mass Communications	1-3
MATX 690	Seminar in Media, Art, and Text	3
MATX 696	Internship	1-3
MATX 791	Directed Study (may be taken for a maximum of 12 credit hours)	1-3

Graduate program director

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Program website: matx.vcu.edu (http://matx.vcu.edu)

School of World Studies

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Mark Wood, Ph.D.
Associate professor and director

Angelina Overvold, Ph.D.
Associate professor and associate director

The School of World Studies explores what it means to be human and prepares students to participate in the work of building a healthy world community. With training in the humanities, social sciences and natural sciences, the school's faculty conduct research on the diversity and universality of human existence and creative expression, generating interdisciplinary knowledge of the evolving and dynamic nature of human beings. Faculty and students explore the development, composition and interaction of language, religion, art, film, literature, poetry and culture and their relationship to gender, nationality, race, social justice, human rights and the environment. Graduates acquire the knowledge, analytic abilities, critical perspectives, and cross-cultural communication skills to succeed in a globalized world.

Degree programs

The School of World Studies offers baccalaureate degrees in the following fields:

Anthropology – Bachelor of Science

Foreign Language – Bachelor of Arts

- French
- German
- Spanish

International Studies– Bachelor of Arts

Religious Studies – Bachelor of Arts

Minors are awarded in these areas:

- African studies
- Anthropology
- Arabic and Middle Eastern studies
- Asian and Chinese studies
- Catholic studies
- European studies
- French
- German
- International social justice studies
- Islamic studies
- Italian studies
- Judaic studies
- Latin American studies
- Mediterranean studies
- Religious studies
- Russian studies
- Spanish
- World cinema

Undergraduate certificates are awarded in these areas:

- International management studies (in conjunction with the School of Business)
- Spanish/English translation and interpretation

Information regarding curricula is provided on the respective program pages.

Languages

The School of World Studies offers students significant opportunities to broaden their knowledge of diverse cultures through language study, including:

- Arabic
- Chinese
- French (major and minor)
- German (major and minor)
- Italian (Italian studies minor)
- Latin
- Russian (Russian studies minor)
- Spanish (major and minor)

In cases where the appropriate level of instruction is unavailable, the School of World Studies Advising Office will assist the student in identifying language study options at other U.S. institutions or abroad.

Study abroad

Summer study-abroad programs provide students with opportunities for short-term immersion in the language, culture and civilization of the countries they visit. A list of current VCU study abroad opportunities can be found at global.vcu.edu/abroad (http://www.global.vcu.edu/abroad). VCU is a member of the International Student Exchange Program, which offers junior year abroad programs at one of 40 universities worldwide. For more information about study abroad visit the School of World Studies website at worldstudies.vcu.edu (http://www.worldstudies.vcu.edu).

Applied Social Research, Certificate in (Post-baccalaureate graduate certificate)

Program goal

This certificate program is designed to enable practitioners to acquire additional knowledge and skills in applied social research without necessarily pursuing a graduate degree and provide marketable job/career skills for graduate degree-seeking students in sociology as well as other graduate programs. Because the certificate program involves a limited number of credit hours and coordinates with the type of statistics and methods courses offered in a number of graduate degree programs, it may be pursued simultaneously with other graduate programs such as sociology, social work, public administration, social policy and urban services. At the same time, individuals seeking more limited, specialized training may pursue the certificate independently.

Student learning outcomes

1. To enable practitioners to acquire additional knowledge and skills in applied social research
2. To provide marketable job/career skills for graduate degree-seeking students in sociology as well as other graduate programs

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 1	

Note: Students may not be able to enroll full time or complete the certificate in one year given the limits on course scheduling.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Students possessing a B.A. or B.S. degree and beginning level skills in statistics/research methods are eligible for admission into the certificate program.
2. Relevant course or research experience will be considered in evaluating admission and substitution of courses. Equivalency tests are available for required courses in statistics and methods.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students in the applied social research certificate program are required to earn a minimum of 18 graduate-level credit hours beyond the baccalaureate.
2. Grade requirements: An overall GPA of 3.0 is required for award of the certificate, and no more than three credit hours of C may be earned in the certificate program curriculum.

Curriculum requirements

Course	Title	Hours
Required courses		
SOCY 601	Sociological Research Methods	3
SOCY 602	Applications of Sociological Research Methods	3
SOCY 603	Seminar in Population Studies	3
or SOCY 656	Social Network Analysis	
SOCY/STAT 608	Statistics for Social Research	3
SOCY 693	Internship	1-6
Recommended electives		
Select one of the following:		3
GVPA 625	Public Policy Analysis	
PSYC 631	Evaluation Research: Psychological Perspectives	
SOCY 603	Seminar in Population Studies	
SOCY/PADM 605	Survey Research Methods	
SOCY 656	Social Network Analysis	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
Total Hours		16-21

Total graduate credit hours required (minimum) 18

Graduate program director
Tara M. Stamm, Ph.D.
Email: tmstamm@vcu.edu
Phone: (804) 828-9432

Program website: sociology.vcu.edu (http://www.sociology.vcu.edu)

Interdisciplinary Studies, Master of (M.I.S.) with a concentration in cinema and language with the University of Cordoba in Spain and the University of Messina in Italy

Note: Admission to this program is temporarily suspended.

Program goals

The cinema and language concentration in the M.I.S. broadens education and career options and is designed to help develop the crucial analytical and communication skills, knowledge base and international experiences needed to pursue a career in the global marketplace.

Student learning outcomes

1. Students will demonstrate competencies to analyze cinema, as well as other visual media, as a means of cultural and artistic expression, as an audiovisual language and as a frame for complex cultural dynamics.
2. Students will be able to analyze film and other visual media (e.g. Internet in general, social media, documentary films, etc.) from different cultures, drawing on a general frame of intercultural communication.
3. Students will achieve fluency in English, Spanish and Italian, especially in their professional field.
4. Students will prepare for international careers through engaged learning and transatlantic team-building experiences with internships in cultural events such as the Taormina Film Festival, the French Film Festival and the Filmoteca de Andalusia.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.I.S.	Fall	May 1	GRE-General

Special requirements

- It is the student's responsibility to obtain the visas necessary to study in Europe and the United States. However, students accepted in the cinema and language concentration will receive assistance with visa applications.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. For admission, **domestic applicants** must submit evidence of knowledge of Italian or Spanish at the "intermediate high" level according to American Council on the Teaching of Foreign Languages guidelines. Domestic students must submit evidence of knowledge of the second language at the "intermediate high" level according to ACTFL guidelines before beginning classes in Europe. Before departure for their first semester abroad (the fall semester at Cordoba begins on Oct. 15), domestic students must function on the following minimum level:
   a. Italian: PLIDA (Progetto Lingua Italiana Dante Alighieri) or equivalent, B1 or similar level. The B1 level indicates the capacity to understand spoken and written texts on familiar topics and to interact in the language to express opinions and explanations in an elementary way.
   b. Spanish: DELE or equivalent, intermediate-mid/threshold level B1 or similar level. The "Certificado Inicial de Español" proves candidates have sufficient knowledge of the language to handle situations which require an elementary use of the language.
2. The achievement of superior language proficiency in their field is one of the most important aims of this concentration. VCU students' proficiency in Spanish and Italian will be assessed by School of World Studies' foreign language faculty according to the guidelines of the ACTFL. (The proficiency guidelines (http://www.actfl.org/publications/guidelines-and-manuals/actfl-proficiency-guidelines-2012) are available on the ACTFL website.)
3. For admission, **European students** must submit transcripts showing that they have received satisfactory grades during their undergraduate studies (minimum GPA of 3.0) and in their first year of graduate study (with no grade lower than C). Students must also pass the TOEFL or the ELP administered by VCU (iBT score of 100; CBT score of 600; or IELTS academic band score of 6.5) and submit a satisfactory GRE score before beginning classes at VCU.
4. Upon review of the application and all supporting documentation, the transatlantic curriculum in cinema and language program coordinator will contact applicants and provide further information.

Note: Admission to this program is temporarily suspended.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: The cinema and language concentration requires 44 credits (semester hours) of course work, with 20 credits taken at the University of Cordoba in Spain and the University of Messina in Italy and 24 hours taken at VCU. At least one-half of the credit hours presented for graduation must be at the 600 level or higher. Each fall, cohorts of VCU and European students (from University of Messina and University of Cordoba) begin a

two-year (four-semester) graduate program. Typically, European students spend the first semester of their first year at the University of Cordoba, second semester at the University of Messina and remaining two semesters at VCU. Domestic students spend their first and second semesters at VCU, third semester at the University of Cordoba and fourth semester at the University of Messina.

2. Other requirements: The final requirement of the program is completion of a directed research project, during which the student is registered for GRAD 697. This is a capstone project culminating in a synthesis of the academic course work and internship experiences as outlined in the student's curriculum plan. Before registration for GRAD 697, a student must have submitted a final project proposal, which has been approved by the concentration graduate program director and the M.I.S. graduate program director. The research project must be graded by a VCU graduate faculty member and a student must receive a grade of A or B in GRAD 697 in order to graduate from the program.
3. Master's-level candidacy: After receiving approval to begin the final directed research project, a student must submit and receive approval for degree candidacy. Approval of degree candidacy must be obtained before a student can begin the final semester of study. Because of the sequencing of cinema and language course work, approval for the final project and degree candidacy may need to occur simultaneously.

Curriculum requirements

Course	Title	Hours
Virginia Commonwealth University		
FREN 511	French Civilization	1-4
GRAD 697	Directed Research	6
GSWS 602	Feminist Research Epistemology and Methods [1]	3
MATX 690	Seminar in Media, Art, and Text	6
WRLD 530	Concepts in World Cinema	3
WRLD 535	World Filmmakers	3
University of Cordoba, Spain		
L-ART/06	Theory and Analysis of Cinema	2
L-ART/06	Cinema and City	2
L-LIN/05	Dialogues between Cinema and Other Arts	2
L-LIN/05	Independent Research Project	3
University of Messina, Italy		
L-ART/06	History of Cinema	2
L-ART/06	Internship at the Taormina Film Festival	3
L-LIN/01	Cinema Translation and Dubbing	2
LFIL-LET/10	Inter-semiotic Relationships: Literature, Theatre and Cinema	2
M-DEA/01	Sociology and Anthropology of Culture	1
M-PED/03	Intercultural Education and Pedagogy	1
Total Hours		44

[1] Other graduate-level methods courses in the social sciences may be taken with prior permission

Total graduate credit hours required (minimum) 44

Graduate program director

Angelina E. Overvold, Ph.D.
Associate director, School of World Studies
Email: aovervol@vcu.edu
Phone: (804) 827-3416

Program website: global.vcu.edu/transatlantic (http://global.vcu.edu/transatlantic)

Interdisciplinary Studies, Master of (M.I.S.), with a concentration in interdisciplinary mathematics and science leadership/K-8 mathematics specialist

Program goals

The interdisciplinary mathematics and science leadership concentration in the M.I.S. program is designed for in-service teachers of mathematics for kindergarten through eighth grades. In designing their individual programs, students, in conjunction with their advisers, may select courses offered by VCU mathematics, science and education departments and courses offered by other collaborating Virginia colleges and universities. The Graduate School, the College of Humanities and Sciences, the School of Education and the departments of Mathematics and Applied Mathematics and Teaching and Learning administer the program.

Student learning outcomes

1. Students will write mathematics (not including mathematical proofs) clearly, concisely and correctly.
2. Students will solve mathematical problems.
3. Students will use multiple representations to correctly describe mathematical ideas.
4. Students will study K-12 children's work and use it to demonstrate knowledge of children's thinking.
5. Students will write mathematical proofs clearly, concisely and correctly.
6. Students will collaborate on projects.
7. Students will read and comprehend mathematical works and mathematics education works, including national and state standards.
8. Students will analyze and synthesize mathematics education literature.
9. Students will make effective written and oral presentations to demonstrate their understanding of mathematical ideas and mathematics education ideas.
10. Students will (a) analyze and develop rich mathematical tasks for children and adults, (b) study and implement models of mathematics coaching, (c) study and implement professional development models.
11. Students will study and implement models of formative and summative assessment.
12. Students will study and implement effective methods of communicating with teachers and administrators.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.I.S.	Fall, spring, summer	Contact program administrator	GRE-General or MAT

Special requirements

- Upon review of the application and all supporting documentation, the mathematics/science leadership program coordinator will contact applicants to schedule interviews to develop programs of study that will detail specific courses to be taken and the institutions offering those courses.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. At least three years of successful K-8 mathematics and/or science teaching experience
2. Three recommendations: at least one from an immediate supervisor or principal and at least one that addresses leadership potential
3. Submission of satisfactory scores on either the GRE or MAT from a current test (fewer than five years old) (Provisional admission may be granted pending fulfillment of this requirement.)
4. A written statement of intent that provides evidence of at least three years of experience in teaching mathematics and/or science for kindergarten through eighth grades
5. Interview to develop program of study (Program director will contact student after initial review of application.)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the interdisciplinary mathematics and science leadership concentration are required to earn a minimum of 36 graduate-level credit hours beyond the baccalaureate. The discipline focus areas are required to be in mathematics and either the sciences or mathematics/science education. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: At least 18 of the 36 credits, including the final project, must be granted by VCU. Up to six transfer credits may be approved, and the remainder of the credits must be from consortium partners as approved by the students' advisers, the VCU Graduate School and the Mathematics and Science Leadership Advisory Committee. A maximum of six hours may be taken as a nondegree-seeking student before admission to the program.
3. The final project must be supervised by a VCU graduate faculty member, may be in mathematics, science or education and must include an indication of the relationship of the subject of the project to teaching at the kindergarten-through-eighth-grade level.

Curriculum requirements

Course	Title	Hours
MATH 661	Number and Operations	3
MATH 662	Geometry and Measurement	3
MATH 663	Functions and Algebra	3
MATH 664	Statistics and Probability	3
MATH 665	Rational Numbers and Proportional Reasoning	3
TEDU 657	Mathematics Education Leadership I	3
TEDU 658	Mathematics Education Leadership II	3

TEDU 659	Mathematics Education Leadership III	3
TEDU 680	Externship Proposal Seminar	3
TEDU 700	Externship	3
Elective courses		
Select from the following with adviser approval:		6
BIOL (500- and 600-level)		
CHEM (500- and 600-level)		
MATH (500- and 600-level)		
TEDU (500- and 600-level)		
Total Hours		36

Total graduate credit hours required (minimum) 36

Graduate program director
Aimee J. Ellington, Ph.D.
Director, M.I.S. interdisciplinary mathematics and science leadership program
Email: ajellington@vcu.edu
Phone: (804) 828-5521

Program website: math.vcu.edu/graduate-programs/mis-specialists (http://math.vcu.edu/graduate-programs/mis-specialists)

Department of African American Studies

Shawn Utsey, Ph.D.
Professor and interim chair

afam.vcu.edu (http://www.afam.vcu.edu)

The Department of African American Studies at Virginia Commonwealth University provides an educationally rich environment in which students and scholars research, learn and teach about the past and present realities of people of African descent. Employing a wide range of theories, perspectives, methods and tools, departmental faculty explore social, political, economic and cultural realities and connections between the experiences of persons in Africa and throughout the African Diaspora. The department emphasizes experiential learning, offers study abroad opportunities and internships.

Department of Biology

Derek Johnson, Ph.D.
Associate professor and chair

Clint Turbeville, Ph.D.
Associate professor and director of graduate studies

biology.vcu.edu (http://biology.vcu.edu)

The Department of Biology offers programs leading to baccalaureate, master's and doctoral degrees; the doctoral degree is offered through the Ph.D. in Integrative Life Sciences program. Students may specialize within many areas, such as molecular and cellular biology, genetics, aquatic and terrestrial ecology, systematics, physiology, neurobiology, and developmental biology. Students also may develop an interdisciplinary focus to their degree program, for example within areas such as bioinformatics, cancer biology, forensic science and environmental science.

In addition to the courses offered by the Department of Biology, graduate students may enroll in graduate courses offered through VCU Life Sciences and these departments in the VCU School of Medicine: Anatomy and Neurobiology, Biochemistry and Molecular Biology, Biostatistics, Human and Molecular Genetics, Microbiology and Immunology, Pathology, Pharmacology and Toxicology, and Physiology and Biophysics. Visit the Department of Biology's website at biology.vcu.edu (http://biology.vcu.edu).

- Biology, Master of Science (M.S.) (p. 229)

Biology, Master of Science (M.S.)

Program goals

The Department of Biology prepares graduate students to:

1. Acquire training in a chosen subdiscipline of biology
2. Learn research techniques used in the subdiscipline
3. Develop presentation skills
4. Develop publication skills

Student learning outcomes

Upon completion of the M.S. in Biology, students will:

1. Demonstrate knowledge of a chosen subfield, including the most recent advances in research
2. Apply appropriate research techniques (i.e., field or lab)
3. Effectively communicate research and findings in a professional context
4. Effectively write papers for publication

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Details on the M.S. degree in biology can be found in the Guidelines for Graduate Studies in Biology at biology.vcu.edu/media/biology/pdf/MS_GuidelinesRevised2015.pdf (http://biology.vcu.edu/media/biology/pdf/MS_GuidelinesRevised2015.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jan 15	GRE
	Spring and summer	By special permission of graduate director	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in biological or related science or equivalent
2. Appropriate college-level background in mathematics, chemistry and physics
3. Three letters of recommendation pertaining to the applicant's potential ability as a graduate student in biology
4. Student's written statement concerning career and research interests
5. Transcripts of all previous college work
6. Satisfactory scores on the GRE (general test)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Master of Science degree candidates are required to take a minimum of 30 graduate credit hours. A maximum of six credit hours from graduate course work taken at other institutions may be transferred if they meet approval of the department.
2. Grade requirements: Receipt of a grade of C or lower in two courses constitutes automatic dismissal from the graduate program in biology. Courses with a grade of C or lower cannot be applied to satisfying the degree requirements.
3. Other requirements: All graduate students are required to write a thesis proposal and a formal thesis following a prescribed format. In order to initiate thesis research, the thesis proposal must be approved by the student's graduate committee and the chair of the department, and the student must be approved for degree candidacy. Each student will be required to pass a final examination, which will be primarily a defense of the thesis. Students may specialize within many areas, such as molecular and cellular biology, genetics, aquatic and terrestrial ecology, systematics, physiology, neurobiology and developmental biology. Students also may develop an interdisciplinary focus to their degree programs, for example, within areas such as bioinformatics, cancer biology, forensic science and environmental science.

Curriculum requirements

Course	Title	Hours
Required courses		11
BIOL 693	Current Topics in Biology	2
BIOL 698	Thesis	6
BIOS 543	Graduate Research Methods I [1]	3
or STAT 543	Statistical Methods I	
Recommended electives		
Choose courses from the following list in consultation with adviser:		19
BIOL/BNFO 601	Integrated Bioinformatics	3
BIOL 606	Quantitative Ecology	3
BIOL 610	Conservation Applications	3
BIOL 618	Ecosystems Ecology	3
BIOL 626	Physiological Ecology	4
BIOL 630	Patterns of Mammalian Reproduction	3
BIOL 640	Evolution and Molecular Markers	3
BIOL 650	Conservation Genetics	3
BIOL/ENVS/URSP 654	Environmental Remote Sensing	3
BIOL 660	Developmental Biology	3
BIOL 676	Plant and Animal Cell Biology	3
BIOL 690	Biology Seminar	1-4
BIOL 691	Special Topics in Biology	1-9
BIOL 692	Independent Study	1-4
BIOL 693	Current Topics in Biology	1-5
BIOL 698	Thesis	1-3
Any 500- or 600-level courses in ANAT, BIOL, BIOC, BIOS, BNFO, CLSE, EGRB, ENVS, HEMS, HGEN, LFSC, MEDC, MICR, NEUS, PCEU, PHTX, PHIS or STAT		
Any 600-level course in CHEM, EDUS, GRAD, MATH, PHYS, PSYC or URSP		

Total graduate credit hours required (minimum) 30

1

Students should take STAT 543 or BIOS 543 as early as possible. Students entering the program with a statistics background equivalent to one of these courses may petition to have this requirement waived.

Students will work with faculty mentors during the first semester of enrollment to provide a plan of elective courses relevant to the subdiscipline.

Note: At least 19 credit hours must be courses designated exclusively for graduate students.

Graduate program director
James M. Turbeville, Ph.D.
Director of graduate studies
Email: jmturbeville@vcu.edu
Phone: (804) 828-0561

Program website: biology.vcu.edu/graduate-program/ms-program-in-biology (http://biology.vcu.edu/graduate-program/ms-program-in-biology)

Department of Chemistry

M. Samy El-Shall, Ph.D.
Professor and chair

Sally S. Hunnicutt, Ph.D.
Associate professor and assistant chair

chemistry.vcu.edu (https://chemistry.vcu.edu)

The Department of Chemistry offers programs leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees. For undergraduate students, the Bachelor of Science offers concentrations in chemical science, professional chemist, professional chemist with honors, biochemistry and chemical modeling.

For graduate students, the Master of Science and Doctor of Philosophy programs provide opportunities for concentrated study in analytical, inorganic, organic or physical chemistry, or chemical physics. A plan of study is worked out for each student to ensure a sound basis for research. In keeping with the university's commitment as an urban institution, the department also offers part-time programs leading to these degrees.

Refer to the department's website for more information: chemistry.vcu.edu (https://chemistry.vcu.edu).

Admission requirements for graduate study

In addition to the general requirements for admission to graduate programs in the Graduate School and the College of Humanities and Sciences, students are expected to have a bachelor's degree from an accredited college or university with 30 semester credits in chemistry. Admission on a provisional basis is possible for a student temporarily lacking this expected chemistry background. Acceptance is based upon undergraduate performance, satisfactory scores on the GRE and letters of recommendation.

Graduate students in the Department of Chemistry may receive financial support via teaching or research assistantships or fellowships. Application forms and instructions for applying to all graduate programs are available on the Graduate School website at graduate.vcu.edu (http://www.graduate.vcu.edu).

General degree requirements for graduate programs

Entering graduate students are required to take proficiency examinations in analytical, inorganic, organic and physical chemistry. These examinations are at the level of sound undergraduate courses and are offered preceding the start of the school's fall and spring semesters. These tests are used to evaluate the student's strengths and weaknesses, and the student's program is planned accordingly.

- Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biochemistry (p. 231)
- Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biology (p. 233)
- Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biology of cancer (p. 235)
- Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in bioorganic chemistry (p. 236)
- Chemistry, Doctor of Philosophy (Ph.D.) (p. 238)
- Chemistry, Doctor of Philosophy (Ph.D.) with a concentration in chemical physics (p. 240)
- Chemistry, Master of Science (M.S.) (p. 242)
- Chemistry, Master of Science (M.S.) with Fudan University [dual degree] (p. 245)
- Nanoscience and Nanotechnology, Doctor of Philosophy (Ph.D.) (p. 248)

Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biochemistry

Program goal

Chemical biology presents a framework for the modern approach to studying the complexities of biological processes. It is already a leading focal point for research in the 21st century, integrating concepts and information from the molecular to the cellular level. This interdisciplinary degree program has participants from the departments of Chemistry, Biology, Biochemistry and Molecular Biology, Medicinal Chemistry and Pharmacology within the College of Humanities and Sciences and the schools of Medicine and Pharmacy.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemical biology
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all

graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Students must present a satisfactory GPA score of a minimum of 3.0 on a 4.0 scale; satisfactory GRE scores (must be less than five years old); a written statement of the candidate's goals; and three letters of recommendation.
2. Students are required to have a bachelor's degree from an accredited college or university with 30 semester credit hours in chemistry or biology. These credit hours should consist of at least two semesters of organic chemistry and a biology course in cell biology, molecular biology or genetics. A physical chemistry course is desirable.
3. If applicants have outstanding potential but lack specific requirements, they may be accepted as provisional. Provisionally accepted students must complete all conditions within one year of enrollment.

Graduate students in the program may receive financial support via teaching or research assistantships or fellowships available from the "home" department. No part-time students are accepted at this time.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemical Biology program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Upon completion of their course work, students will complete their dissertation requirements, which will typically consist of a written and oral dissertation proposal, research and literature seminars, and both a written and oral dissertation defense.

Curriculum requirements

Course	Title	Hours
Courses [1]		
CHEB 601	Chemical Biology I	3
CHEB 602	Chemical Biology II	3
CHEB 690	Research Seminars in Chemical Biology (credit hours are variable) [2]	variable
or CHEM 690	Research Seminar in Chemistry	
CHEB 697	Chemical Biology Research Rotations (credit hours are variable) [3]	variable
CHEM 693	Chemistry Perspectives and Ethics [4]	1
CHEM 697	Directed Research (credit hours are variable) [5]	variable
Electives		
Select 11 credit hours from the following: [6]		11
BIOC 500- and 600-level courses		
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOC 602	Physical Properties of Macromolecules	
BIOC 605	Molecular Biology	
CHEM 500- and 600-level courses		
CHEM 504	Advanced Organic Chemistry I	
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry	
CHEM 604	Advanced Organic Chemistry II	
CHEM 633	Mass Spectrometry	
MEDC 500- and 600-level courses		

MEDC 541	Survey of Molecular Modeling Methods
MEDC 670	Advanced Molecular Modeling Theory and Practice
PHTX 500- and 600-level courses	

1

At least 18 credit hours of didactic course work must be completed.

2

Students are expected to participate in their home department's seminar program.

3

Students are expected to enroll in CHEB 697 or directed research (one credit minimum) every spring and fall semester.

4

Students are expected to enroll in CHEM 693 within their first year of matriculation. Other courses may be used to satisfy this requirement in research conduct and ethics in consultation with the graduate program director.

5

Students may also enroll in BIOC 697 for directed research credit hours.

6

The list of recommended electives includes some typical courses taken in this concentration, but there is flexibility in designing a program of study in consultation with the adviser and graduate program director.

Total graduate credit hours required (minimum) 72

Graduate program director
Nicholas Farrell, Ph.D.
Professor and graduate director, chemical biology program, Department of Chemistry
npfarrell@vcu.edu
(804) 828-6320

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website: chembio.vcu.edu (http://www.chembio.vcu.edu)

Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biology

Program goal

Chemical biology presents a framework for the modern approach to studying the complexities of biological processes. It is already a leading focal point for research in the 21st century, integrating concepts and information from the molecular to the cellular level. This interdisciplinary degree program has participants from the departments of Chemistry, Biology, Biochemistry and Molecular Biology, Medicinal Chemistry and Pharmacology within the College of Humanities and Sciences and the schools of Medicine and Pharmacy.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemical biology
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Students must present a satisfactory GPA score of a minimum of 3.0 on a 4.0 scale; satisfactory GRE scores (must be less than five years old); a written statement of the candidate's goals; and three letters of recommendation.
2. Students are required to have a bachelor's degree from an accredited college or university with 30 semester credit hours in chemistry or biology. These credit hours should consist of at least two semesters of organic chemistry and a biology course in cell biology, molecular biology or genetics. A physical chemistry course is desirable.
3. If applicants have outstanding potential but lack specific requirements, they may be accepted as provisional. Provisionally accepted students must complete all conditions within one year of enrollment.

Graduate students in the program may receive financial support via teaching or research assistantships or fellowships available from the "home" department. No part-time students are accepted at this time.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemical Biology program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Upon completion of their course work, students will complete their dissertation requirements, which will typically consist of a written and oral dissertation proposal, research and literature seminars, and both a written and oral dissertation defense.

Curriculum requirements

Course	Title	Hours
Courses [1]		
CHEB 601	Chemical Biology I	3
CHEB 602	Chemical Biology II	3
CHEB 690	Research Seminars in Chemical Biology (credit hours variable) [2]	variable
or CHEB 690	Research Seminars in Chemical Biology	
CHEB 697	Chemical Biology Research Rotations (credit hours variable) [3]	variable
CHEM 693	Chemistry Perspectives and Ethics [4]	1
CHEM 697	Directed Research (credit hours variable) [5]	variable
Electives		
Select four of the following: [6]		11
BIOC 500- and 600-level courses		
BIOC 605	Molecular Biology	
BIOL 500- and 600-level courses		
BIOL 545/ LFSC 510	Biological Complexity	
BIOL 548/ LFSC 520	Bioinformatic Technologies	
BIOL 565	Advances in Cell Signaling	
BIOL 676	Plant and Animal Cell Biology	
CHEM 500- and 600-level courses		
CHEM 504	Advanced Organic Chemistry I	
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry	
CHEM 604	Advanced Organic Chemistry II	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
LFSC 500- and 600-level courses		
LFSC 510	Biological Complexity	
LFSC 520	Bioinformatic Technologies	
MEDC 500- and 600-level courses		
PHTX 500- and 600-level courses		

1

At least 18 credit hours of didactic course work must be completed.

2

Students are expected to participate in their home department's seminar program.

3

Students are expected to enroll in CHEB 697 or directed research (one credit minimum) every spring and fall semester.

4

Students are expected to enroll in CHEM 693 within their first year of matriculation. Other courses may be used to satisfy this requirement in research conduct and ethics in consultation with the graduate program director.

5

Students may also enroll in CHEB 697 or PHIS 697 for directed research credit hours.

6

The list of recommended electives includes some typical courses taken in this concentration, but there is flexibility in designing a program of study in consultation with the adviser and graduate program director.

Total graduate credit hours required (minimum) 72

Graduate program director

Nicholas Farrell, Ph.D.

Professor and graduate director, chemical biology program, Department of Chemistry
npfarrell@vcu.edu
(804) 828-6320

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website: chembio.vcu.edu (http://www.chembio.vcu.edu)

Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in biology of cancer

Program goal

Chemical biology presents a framework for the modern approach to studying the complexities of biological processes. It is already a leading focal point for research in the 21st century, integrating concepts and information from the molecular to the cellular level. This interdisciplinary degree program has participants from the departments of Chemistry, Biology, Biochemistry and Molecular Biology, Medicinal Chemistry and Pharmacology within the College of Humanities and Sciences and the schools of Medicine and Pharmacy.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemical biology
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Students must present a satisfactory GPA score of a minimum of 3.0 on a 4.0 scale; satisfactory GRE scores (must be less than five years old); a written statement of the candidate's goals; and three letters of recommendation.
2. Students are required to have a bachelor's degree from an accredited college or university with 30 semester credit hours in chemistry or biology. These credit hours should consist of at least two semesters of organic chemistry and a biology course in cell biology, molecular biology or genetics. A physical chemistry course is desirable.
3. If applicants have outstanding potential but lack specific requirements, they may be accepted as provisional. Provisionally accepted students must complete all conditions within one year of enrollment.

Graduate students in the program may receive financial support via teaching or research assistantships or fellowships available from the "home" department. No part-time students are accepted at this time.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemical Biology program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Upon completion of their course work, students will complete their dissertation requirements, which will typically consist of a written and oral dissertation proposal, research and literature seminars, and both a written and oral dissertation defense.

Curriculum requirements

Course	Title	Hours
Courses [1]		
CHEB 601	Chemical Biology I	3
CHEB 602	Chemical Biology II	3
CHEB 690	Research Seminars in Chemical Biology (credit hours variable) [2]	variable
or CHEM 690	Research Seminar in Chemistry	
CHEB 697	Chemical Biology Research Rotations (credit hours variable) [3]	variable
CHEM 693	Chemistry Perspectives and Ethics [4]	1
CHEM 697	Directed Research (credit hours variable) [5]	variable
Electives		
Select 11 credit hours from the following: [6]		11
BIOC 500- and 600-level courses		
BIOL 500- and 600-level courses		
CHEM 500- and 600-level courses		
CHEM 504	Advanced Organic Chemistry I	
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry	
CHEM 604	Advanced Organic Chemistry II	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
MEDC 500- and 600-level courses		
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
PHTX 500- and 600-level courses		
PHTX 536	Principles of Pharmacology and Toxicology	

1

At least 18 credit hours of didactic course work must be completed.

2

Students are expected to participate in their home department's seminar program.

3

Students are expected to enroll in CHEB 697 or directed research (one credit minimum) every spring and fall semester.

4

Students are expected to enroll in CHEM 693 within their first year of matriculation. Other courses may be used to satisfy this requirement in research conduct and ethics in consultation with the graduate program director.

5

Students may also enroll in PHTX 697 for directed research credit hours.

6

The list of recommended electives includes some typical courses taken in this concentration, but there is flexibility in designing a program of study in consultation with the adviser and graduate program director.

Total graduate credit hours required (minimum) 72

Graduate program director
Nicholas Farrell, Ph.D.
Professor and graduate director, chemical biology program, Department of Chemistry
npfarrell@vcu.edu
(804) 828-6320

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website: chembio.vcu.edu (http://www.chembio.vcu.edu)

Chemical Biology, Doctor of Philosophy (Ph.D.) with a concentration in bioorganic chemistry

Program goal

Chemical biology presents a framework for the modern approach to studying the complexities of biological processes. It is already a leading focal point for research in the 21st century, integrating concepts and information from the molecular to the cellular level. This interdisciplinary degree program has participants from the departments of Chemistry, Biology, Biochemistry and Molecular Biology, Medicinal Chemistry and Pharmacology within the College of Humanities and Sciences and the schools of Medicine and Pharmacy.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemical biology
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently

4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Students must present a satisfactory GPA score of a minimum of 3.0 on a 4.0 scale; satisfactory GRE scores (must be less than five years old); a written statement of the candidate's goals; and three letters of recommendation.
2. Students are required to have a bachelor's degree from an accredited college or university with 30 semester credit hours in chemistry or biology. These credit hours should consist of at least two semesters of organic chemistry and a biology course in cell biology, molecular biology or genetics. A physical chemistry course is desirable.
3. If applicants have outstanding potential but lack specific requirements, they may be accepted as provisional. Provisionally accepted students must complete all conditions within one year of enrollment.

Graduate students in the program may receive financial support via teaching or research assistantships or fellowships available from the "home" department. No part-time students are accepted at this time.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemical Biology program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Upon completion of their course work, students will complete their dissertation requirements, which will typically consist of a written and oral dissertation proposal, research and literature seminars, and both a written and oral dissertation defense.

Curriculum requirements

Course	Title	Hours
Courses [1]		
CHEB 601	Chemical Biology I	3
CHEB 602	Chemical Biology II	3
CHEB 690	Research Seminars in Chemical Biology (credit hours variable) [2]	variable
or CHEM 690	Research Seminar in Chemistry	
CHEB 697	Chemical Biology Research Rotations (credit hours variable) [3]	variable
CHEM 693	Chemistry Perspectives and Ethics [4]	1
CHEM 697	Directed Research (credit hour variable) [5]	variable
Electives		
Select 11 credit hours of the following: [6]		11
BIOC 500- and 600-level courses		

BIOC 503	Biochemistry, Cell and Molecular Biology
BIOC 504	Biochemistry, Cell and Molecular Biology
BIOC 602	Physical Properties of Macromolecules
BIOC 605	Molecular Biology
CHEM 500- and 600-level courses	
CHEM 504	Advanced Organic Chemistry I
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry
CHEM 604	Advanced Organic Chemistry II
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry
CHEM 633	Mass Spectrometry
MEDC 500- and 600-level courses	
MEDC 541	Survey of Molecular Modeling Methods
MEDC 670	Advanced Molecular Modeling Theory and Practice
PHTX 500- and 600-level courses	

1

At least 18 credit hours of didactic course work must be completed.

2

Students are expected to participate in their home department's seminar program.

3

Students are expected to enroll in CHEB 697 or directed research (one credit minimum) every spring and fall semester.

4

Students are expected to enroll in CHEM 693 within their first year of matriculation. Other courses may be used to satisfy this requirement in research conduct and ethics in consultation with the graduate program director.

5

Students may also enroll in BIOC 697 for directed research credit hours.

6

The list of recommended electives includes some typical courses taken in this concentration, but there is flexibility in designing a program of study in consultation with the adviser and graduate program director.

Total graduate credit hours required (minimum) 72

Graduate program director
Nicholas Farrell, Ph.D.
Professor and graduate director, chemical biology program, Department of Chemistry
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Additional contact
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(804) 828-7509

Program website: chembio.vcu.edu (http://www.chembio.vcu.edu)

Chemistry, Doctor of Philosophy (Ph.D.)

Program goal

The Department of Chemistry is committed to the dual mission of teaching and research at the bachelor's, master's and doctoral level. In teaching, the purpose is to provide high quality education in chemistry to students in preparation for professional careers at all levels. In research, the goals are to advance the science of chemistry, to keep faculty on the forefront of the field and to maintain an educational program consistent with the latest technology and development of the discipline. Service to the chemical profession is also an important aspect of the department's activities.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemistry
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The Department of Chemistry graduate handbook is available at chemistry.vcu.edu/graduate-programs/graduate-handbook (http://chemistry.vcu.edu/graduate-programs/graduate-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE-General
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Have a bachelor's degree from an accredited college or university with 30 credit hours in chemistry.
2. Admission on a provisional basis is possible for a student temporarily lacking this expected chemistry background.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemistry program are required to earn a minimum of 60 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Proficiency exams: Students must demonstrate competency in analytical, inorganic, organic and physical chemistry by satisfactory performance on the proficiency exams or with a minimum grade of B in the appropriate course. These examinations are at the level of sound undergraduate courses and are offered preceding the start of the school's fall and spring semesters. These tests are used to evaluate the student's strengths and weaknesses, and the student's program is planned accordingly.
3. Doctoral candidacy: The student is required to complete written and oral examinations in his/her major field to become a doctoral candidate. The written examinations consist of a series of cumulative exams based on the chemistry literature. The oral examination includes the presentation and defense of the proposed dissertation research.
4. Dissertation: Students must conduct a substantial original investigation under the supervision of their adviser. Students who wish to include a chemical education component in their research will choose two advisers, one in the cognate area, and one in the area of chemical education. All formal requirements for the degree are otherwise the same as for any doctoral student. Students must prepare dissertations reporting the results of the research and analyzing its significance in relation to existing scientific knowledge. An oral defense of the dissertation will be held. Full-time students should complete the degree requirements in four to five years.

Curriculum requirements

Course	Title	Hours
Required didactic courses [1]		
Select three core courses of the following four areas: analytical, inorganic, organic and physical [2]		9
CHEM 504	Advanced Organic Chemistry I	
CHEM 510	Atomic and Molecular Structure [4]	
or CHEM 511	Chemical Thermodynamics and Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 63xx or ENGR 691 (courses in analytical area) [3]		
Course completed twice		1
CHEM 698	Investigations in Current Chemistry Literature (0.5 credit hour) [5]	
Select eight credit hours of the following recommended electives, in consultation with adviser:		8
BIOC 500-level (except BIOC 505, BIOC 506 and BIOC 507)		
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism	
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	
BIOC 602	Physical Properties of Macromolecules	
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
CHEB 601	Chemical Biology I	
CHEB 602	Chemical Biology II	
CHEM 500-level		
CHEM 600-level		
CHEM 610	Applied Quantum Chemistry	
CHEM 611	Molecular Spectroscopy	

CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	
CHEM 615	Chemical Thermodynamics	
CHEM 616	Chemical Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 621	Advanced Inorganic Chemistry II	
CHEM 630	Electroanalytical Chemistry	
CHEM 631	Separation Science	
CHEM 632	Chemometrics	
CHEM 633	Mass Spectrometry	
CHEM 634	Surface Science	
CHEM 635	Spectrochemical Analysis	
CHEM 691	Topics in Chemistry	
CHEM 698	Investigations in Current Chemistry Literature [5]	
ENGR 591	Special Topics in Engineering	
ENGR 691	Special Topics in Engineering	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 609	Advanced Organic Synthesis: A Target-oriented Approach	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
NANO 570	Nanoscale Physics	
NANO 571	Nanoscale Chemistry	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	
NANO 660	Theoretical Studies of Nanostructures	
NANO 661	Computational Nanoscience	
PHYS 550	Techniques in Material Research	
PHYS 573	Analytical Methods in Physics	
PHYS 576	Electromagnetic Theory	
PHYS 580	Quantum Mechanics	
PHYS 591	Topics in Physics	
PHYS 661	Surface and Materials Physics	
PHYS 691	Special Topics	
Other required courses		
CHEM 690	Research Seminar in Chemistry [6]	1-8
CHEM 692	Chemistry Seminar Presentation [6]	2
CHEM 693	Chemistry Perspectives and Ethics [7]	1
CHEM 697	Directed Research [8]	30

1

Students must earn a minimum of 18 credit hours in eight didactic graduate courses, not including credit for CHEM 690, CHEM 692, CHEM 693 or CHEM 697.

2

One of these courses may be waived upon satisfactory proficiency exam scores. The number of required credit hours for the degree does not change.

3

The ENGR 691 topics course must be materials characterization.

4

In some cases, students may be required to enroll in both CHEM 510 and CHEM 511 because of proficiency exam scores.

5

Students are expected to enroll in CHEM 698 (.05 credit hour) twice during their graduate studies, including the semester preceding their literature seminar presentation (CHEM 692). Note: A maximum of two credit hours of CHEM 698 may be presented toward the didactic course graduation requirements to count as one course.

6

Students are expected to participate in the department's seminar program by enrolling in CHEM 690 or CHEM 692 every spring and fall semester. At least two formal talks are to be presented in the seminar program by enrolling twice in CHEM 692 (one credit hour).

7

Students are expected to enroll in CHEM 693 within the first year of study.

8

Students must enroll in CHEM 697 (one credit hour minimum) every spring and fall semester for a minimum of 30 total credit hours. If the required minimum of 60 credit hours for the degree is not fulfilled after completion of all other course requirements, then additional credit hours of CHEM 697 may satisfy remaining credit hours for the degree.

Total graduate credit hours required (minimum) 60

Graduate program director
Sarah C. Rutan, Ph.D.
Professor and graduate coordinator, Department of Chemistry
srutan@vcu.edu
(804) 828-7517

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department
of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website: chemistry.vcu.edu (http://chemistry.vcu.edu)

Chemistry, Doctor of Philosophy (Ph.D.) with a concentration in chemical physics

Program goal

The Department of Chemistry is committed to the dual mission of teaching and research at the bachelor's, master's and doctoral level. In teaching, the purpose is to provide high quality education in chemistry to students in preparation for professional careers at all levels. In research, the goals are to advance the science of chemistry, to keep faculty on the forefront of the field and to maintain an educational program consistent with the latest technology and development of the discipline. Service to

the chemical profession is also an important aspect of the department's activities.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemistry
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The Department of Chemistry graduate handbook is available at chemistry.vcu.edu/graduate-programs/graduate-handbook (http://chemistry.vcu.edu/graduate-programs/graduate-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Mar 15	GRE-General
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Have a bachelor's degree from an accredited college or university with 30 credit hours in chemistry or in physics.
2. Admission on a provisional basis is possible for a student temporarily lacking this expected chemistry background or in physics.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the Ph.D. in Chemistry program are required to earn a minimum of 60 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Proficiency exams: Students entering the chemical physics concentration must pass proficiency examinations in two areas of chemistry and two areas of physics (mechanics, electricity and magnetism). Students entering with a bachelor's or master's degree in chemistry who have not taken the courses previously may satisfy the physics requirement with an A or B in PHYS 301 Classical Mechanics I and PHYS 302 Classical Mechanics II and PHYS 376 Electromagnetism. Students entering with a bachelor's or master's degree in physics who have not taken the chemistry courses previously may satisfy the chemistry requirement with an A or B in two of the four courses, CHEM 301 Organic Chemistry-CHEM 302 Organic Chemistry; the two-course sequence counts as one course only), CHEM 406 Inorganic Chemistry II, CHEM 409 Instrumental Analysis or CHEM 510 Atomic and Molecular Structure.
3. Doctoral candidacy: The student is required to complete written and oral examinations in his/her major field to become a doctoral candidate. The written examinations consist of a series of cumulative exams based on the chemistry literature. The oral examination includes the presentation and defense of the proposed dissertation research.
4. Dissertation: The student must conduct a substantial original investigation under the supervision of his/her adviser and must prepare a dissertation reporting the results of the research and analyzing its significance in relation to existing scientific knowledge.

An oral defense of the dissertation will be held. Full-time students should complete the degree requirements in four to five years.

Curriculum requirements

Course	Title	Hours
Required didactic courses [1]		
CHEM 510	Atomic and Molecular Structure	3
or PHYS 580	Quantum Mechanics	
CHEM 511	Chemical Thermodynamics and Kinetics	3
CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	3
PHYS 576	Electromagnetic Theory	3
PHYS 641	Solid State Physics	3
Recommended electives		
Select nine credit hours of the following, in consultation with adviser		9
CHEM 512	Applied Molecular Modeling	
CHEM 550	Introduction to Polymer Chemistry	
CHEM 591	Topics in Chemistry	
CHEM 610	Applied Quantum Chemistry	
CHEM 611	Molecular Spectroscopy	
CHEM 615	Chemical Thermodynamics	
CHEM 616	Chemical Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 634	Surface Science	
CHEM 635	Spectrochemical Analysis	
CHEM 691	Topics in Chemistry	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	
PHYS 550	Techniques in Material Research	
PHYS 571	Theoretical Mechanics	
PHYS 573	Analytical Methods in Physics	
PHYS 661	Surface and Materials Physics	
PHYS 691	Special Topics	
Other required courses		
CHEM 690	Research Seminar in Chemistry [3]	1-8
or PHYS 690	Research Seminar	
CHEM 692	Chemistry Seminar Presentation [3]	2
CHEM 693	Chemistry Perspectives and Ethics [4]	1
CHEM 697	Directed Research [5]	30
or PHYS 697	Directed Research	

1

Students must earn a minimum of 24 credit hours in didactic graduate courses, not including credit for CHEM 690, CHEM 692, CHEM 693 or CHEM 697.

2

At least 12 credit hours of the 24 required didactic course credit hours must be CHEM graduate courses. Therefore, depending on the choice of CHEM 510 or PHYS 580 above, at least 3 to 6 credit hours chosen from the list of recommended electives must be CHEM graduate courses, respectively.

3

Students are expected to participate in the chemistry and/or physics department seminar program by enrolling in CHEM 690, CHEM 692 or PHYS 690 every spring and fall semester. At least two formal talks are to be presented in the seminar program by enrolling twice in CHEM 692 (one credit hour).

4

Students are expected to enroll in CHEM 693 within their first year of enrollment.

5

Students are expected to enroll in CHEM 697 or PHYS 697 (one credit hour minimum) every spring and fall semester. Up to 15 credit hours of PHYS 697 can be used to satisfy the minimum requirement of 30 credit hours of directed research. If the required 60 credit hours for the degree is not fulfilled after completion of all other course requirements, then additional credit hours of CHEM 697 can satisfy the remaining credit hours for the degree.

Total number of graduate credit hours required (minimum) 60

Graduate program director
Sarah C. Rutan, Ph.D.
Professor and graduate coordinator, Department of Chemistry
srutan@vcu.edu
(804) 828-7517

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website:chemistry.vcu.edu (http://chemistry.vcu.edu)

Chemistry, Master of Science (M.S.)

Program goal

The Department of Chemistry is committed to the dual mission of teaching and research at the bachelor's, master's and doctoral level. In teaching, the purpose is to provide high quality education in chemistry to students in preparation for professional careers at all levels. In research, the goals are to advance the science of chemistry, to keep faculty on the forefront of the field and to maintain an educational program consistent with the latest technology and development of the discipline. Service to the chemical profession is also an important aspect of the department's activities.

Student learning outcomes

1. Demonstrate expertise (breadth and depth) in chemistry
2. Demonstrate appropriate ability to design and conduct experimental research

3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The Department of Chemistry graduate handbook is available at chemistry.vcu.edu/graduate-programs/graduate-handbook (http://chemistry.vcu.edu/graduate-programs/graduate-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	GRE-General
	Spring	Nov 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Have a bachelor's degree from an accredited college or university with 30 credit hours in chemistry
2. Admission on a provisional basis is possible for a student temporarily lacking this expected chemistry background.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.S. in Chemistry program are required to earn a minimum of 30 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Proficiency exams: Students must demonstrate competency in analytical, inorganic, organic and physical chemistry by satisfactory performance on the proficiency exams or with a minimum grade of B in the appropriate course. These examinations are at the level of sound undergraduate courses and are offered preceding the start of the school's fall and spring semesters. These tests are used to evaluate the student's strengths and weaknesses, and the student's program is planned accordingly.
3. Other requirements: Students are to conduct a research study under the guidance of a thesis adviser. After their first year, students are required to present their research at a poster presentation every fall semester. Once students have completed all required course work (with a 3.0 GPA) and the literature seminar, they must submit the application to candidacy form to the chemistry graduate director. After candidacy, an acceptable research thesis and a final oral examination on the thesis are required. Full-time students should complete these degree requirements in two to three years.

Curriculum requirements

Course	Title	Hours
Required didactic courses [1]		
Select three core courses of the following four areas: analytical, inorganic, organic and physical [2]		9
CHEM 504	Advanced Organic Chemistry I	
CHEM 510	Atomic and Molecular Structure [4]	
or CHEM 511	Chemical Thermodynamics and Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	

CHEM 63x or ENGR 691 (course in analytical area) [3]		
Course completed twice		1
CHEM 698	Investigations in Current Chemistry Literature (0.5 credit hour)	
Select five credit hours of recommended electives from the following, in consultation with adviser		5
BIOC 500-level (except BIOC 505, BIOC 506 and BIOC 507)		
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism	
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	
BIOC 602	Physical Properties of Macromolecules	
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
CHEB 601	Chemical Biology I	
CHEB 602	Chemical Biology II	
CHEM 500-level		
CHEM 604	Advanced Organic Chemistry II	
CHEM 605	Physical Organic Chemistry	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
CHEM 610	Applied Quantum Chemistry	
CHEM 611	Molecular Spectroscopy	
CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	
CHEM 615	Chemical Thermodynamics	
CHEM 616	Chemical Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 621	Advanced Inorganic Chemistry II	
CHEM 630	Electroanalytical Chemistry	
CHEM 631	Separation Science	
CHEM 632	Chemometrics	
CHEM 633	Mass Spectrometry	
CHEM 634	Surface Science	
CHEM 635	Spectrochemical Analysis	
CHEM 691	Topics in Chemistry	
CHEM 698	Investigations in Current Chemistry Literature [5]	
ENGR 591	Special Topics in Engineering	
ENGR 691	Special Topics in Engineering	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
NANO 570	Nanoscale Physics	
NANO 571	Nanoscale Chemistry	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	
NANO 660	Theoretical Studies of Nanostructures	
NANO 661	Computational Nanoscience	
PHYS 550	Techniques in Material Research	
PHYS 573	Analytical Methods in Physics	
PHYS 576	Electromagnetic Theory	
PHYS 580	Quantum Mechanics	
PHYS 591	Topics in Physics	
PHYS 661	Surface and Materials Physics	
PHYS 691	Special Topics	
Other required courses		
CHEM 690	Research Seminar in Chemistry (credit hours variable) [6]	
CHEM 692	Chemistry Seminar Presentation [6]	2
CHEM 693	Chemistry Perspectives and Ethics [7]	1
CHEM 697	Directed Research [8]	12
Total Hours		30

1

Students must earn a minimum of 15 credit hours in six didactic graduate courses, not including credit hours for CHEM 690, CHEM 692, CHEM 693 or CHEM 697.

2

One of these courses may be waived upon satisfactory proficiency exam scores. The required number of credit hours for the degree does not change.

3

The ENGR 691 topics course must be materials characterization.

4

In some cases, students may be required to enroll in both CHEM 510 and CHEM 511 because of proficiency exam scores.

5

Students are expected to enroll in CHEM 698 (0.5 credit hour) twice during their graduate studies, including the semester preceding their literature seminar presentation (CHEM 692). Note: A maximum of two credit hours of CHEM 698 may be presented toward the didactic course graduation requirements to count as one course.

6

Students are expected to participate in the department's seminar program by enrolling in CHEM 690 or CHEM 692 every spring and fall semester. At least two formal talks are to be presented in the seminar program by enrolling twice in CHEM 692 (one credit hour).

7

Students are expected to enroll in CHEM 693 within their first year of enrollment.

8

Students are expected to enroll in CHEM 697 (one credit hour minimum) every spring and fall semester.

Total graduate credit hours required (minimum) 30

Graduate program director
Sarah C. Rutan, Ph.D.
Professor and graduate coordinator, Department of Chemistry
srutan@vcu.edu
(804) 828-7517

Additional contact
Maryanne M. Collinson, Ph.D.
Professor and chair of graduate recruiting and admissions committee, Department of Chemistry
mmcollinson@vcu.edu
(804) 828-7509

Program website: chemistry.vcu.edu (http://chemistry.vcu.edu)

Chemistry, Master of Science (M.S.) with Fudan University [dual degree]

Program goals

The VCU Department of Chemistry is committed to the dual mission of teaching and research at the bachelor's, master's and doctoral level. In teaching, the purpose is to provide high quality education in chemistry to students in preparation for professional careers at all levels. In research, the goals are to advance the science of chemistry, to keep faculty on the forefront of the field and to maintain an educational program consistent with the latest technology and development of the discipline. Service to the chemical profession is also an important aspect of the department's activities.

Student learning outcomes

Graduates of the program must:

1. Demonstrate expertise (breadth and depth) in chemistry
2. Demonstrate appropriate ability to design and conduct experimental research
3. Demonstrate ability to analyze data critically and to design experiments independently
4. Develop competency in the responsible conduct of research
5. Develop effective oral and written communication skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The Department of Chemistry graduate handbook is available at chemistry.vcu.edu/graduate-programs/graduate-handbook (http://chemistry.vcu.edu/graduate-programs/graduate-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15	GRE-General TOEFL (International students only)
	Spring	Oct 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have a bachelor's degree from an accredited college or university with 30 credit hours in chemistry. (Admission on a

provisional basis is possible for a student temporarily lacking this expected chemistry background.)

2. Graduate students in the Department of Chemistry may receive financial support via teaching or research assistantships or fellowships. Application forms and instructions for applying to all graduate programs are available on the Graduate School website at graduate.vcu.edu (http://www.graduate.vcu.edu).
3. Fudan University students participating in this dual degree program will be full-time students in good standing in Fudan University's Department of Chemistry.
4. Fudan University students will be required to (a) successfully pass an interview at Fudan University conducted by an identified faculty member of VCU's Chemistry Department and (b) successfully pass an English proficiency exam before the application to VCU will be processed.
5. Fudan University students' program will be required to submit formal applications to the VCU International Admissions Office. The VCU Department of Chemistry is responsible for admitting these students to VCU.
6. Fudan University students will be required to submit to VCU their Fudan transcripts and grade-related information before their applications to VCU will be processed.
7. Fudan University students are classified as full-time, out-of-state graduate students and will assume all tuition, fees, housing and cost-of-living expenses while at VCU.
8. Students must receive a positive evaluation from both the Fudan and VCU chemistry departments to receive admission into the program. As part of the admission process, a member of VCU's Department of Chemistry will interview applicants in Shanghai prior to admission into the program.
9. Fudan University students are required to maintain the equivalent of a VCU B average including their first year at Fudan University.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.S. in Chemistry program are required to earn a minimum of 30 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Proficiency exams: Students must demonstrate competency in analytical, inorganic, organic and physical chemistry by satisfactory performance on the proficiency exams or with a minimum grade of B in the appropriate course. These examinations are at the level of sound undergraduate courses and are offered preceding the start of the school's fall and spring semesters. These tests are used to evaluate the student's strengths and weaknesses, and the student's program is planned accordingly.
3. Other requirements: Students are to conduct a research study under the guidance of a thesis adviser. After their first year, students are required to present their research at a poster presentation every fall semester. Once students have completed all required course work (with a 3.0 GPA) and the literature seminar, they must submit the application to candidacy form to the chemistry graduate director. After candidacy, an acceptable research thesis and a final oral examination on the thesis are required. Full-time students should complete these degree requirements in two to three years.

Program schedule

1. In the first year (two semesters) at Fudan University, the Fudan student will successfully complete core courses required of all graduate students in the VCU M.S. in Chemistry program. The Department of Chemistry at VCU requires an M.S. student to earn a minimum of 15 credit hours in six graduate courses. A further minimum of 20 credit hours must be earned in seminar, seminar discussion, a mandatory course on chemistry perspectives and ethics and directed research courses. A departmental committee, composed of the VCU graduate program director, the VCU graduate admissions director and the Fudan program director, will determine the transferability and correspondence of Fudan courses to VCU courses and credit hours before the student enters VCU. This committee will advise the individual student on course work and credits eligible for transfer to meet the 15-credit didactic course requirement and what, if any, further course work should be taken.
2. In the second year (two semesters) at VCU, the student will immediately begin laboratory research (CHEM 697). The student will also identify a thesis adviser no later than the beginning of enrollment at VCU (third semester of program). A co-adviser from Fudan University will also be appointed at this time. The student will enroll in didactic courses offered by the Department of Chemistry at the discretion of the VCU adviser. It is envisaged that the core courses will have been taken at Fudan and that specialized and topics courses will be taken at VCU. The Department of Chemistry will not create new courses for Fudan students.
3. In the third year, the Fudan student will remain at VCU to complete the fifth semester of the program. The student will continue to select from the department's regular course offerings and will continue to work on the thesis with the VCU thesis adviser. All research data should be obtained by the end of the third semester at VCU.
4. In the sixth and final semester, the Fudan student will return to Fudan University to complete the writing of the thesis and will enroll in final elective courses (if necessary) pertinent to the student's area of concentration. The two thesis advisers (one from VCU and one from Fudan) will oversee the completion of the thesis. The formal thesis will be written in Chinese with an English translation.

Curriculum requirements

Fudan University

Course	Title	Hours
Prepatory foundation courses		
Following are required but do not count toward the 30 graduate credit-hour requirement		
Philosophy		
Theory and Practice of Socialism		
English of Master of Science		
Specialty English		
Required courses		
CHEM 6001	Advanced Inorganic Chemistry	3
CHEM 6002	Advanced Organic Chemistry	3
CHEM 6003	Principles of Quantum Chemistry and Its Applications	3
CHEM 6004	Advanced Analysis for Molecular Science	3
CHEM 6005	Advanced Polymer Chemistry	3

CHEM 6006	Polymer and Condensed Matter Physics	3
Recommended Fudan electives		
Select 12 credit hours of the following:		12
CHEM 6007 Advanced Inorganic Synthesis		
CHEM 6008 Inorganic Experiment		
CHEM 6009 Inorganic Synthesis		
CHEM 6010 Advanced Instrumental Analysis		
CHEM 6013 Advanced Organic Synthesis		
CHEM 6014 Advanced Experimental Organic Synthesis		
CHEM 6015 Chemical Statistical Thermodynamics		
CHEM 6016 Advanced Physical Chemistry Experiments		
CHEM 7003 Structural Analysis of Organics		
CHEM 7004 Synthetic Chemistry in Medicine		
CHEM 7005 Organic Chemistry		
CHEM 7006 Microporous Material Chemistry		
CHEM 7007 Principles of Heterogeneous Catalysis		
CHEM 7008 Novel Catalytic Materials		
CHEM 7010 Green Chemistry		
CHEM 7011 Catalysis: From Laboratory to Industrial Process		
CHEM 7017 NMR Principal and Experimental Technology		
CHEM 7018 Sol-Gel Chemistry		
CHEM 8001 Progress in Bio-Inorganic Chemistry		
CHEM 8002 Progress in Organometallic Chemistry		
CHEM 8003 Progress in Contemporary Inorganic Chemistry		
CHEM 8016 Modern Organometallic Chemistry		
CHEM 8039 Coordination Chemistry		
CHEM 8041 Organometallic Chemistry Applied in Organic Synthesis		
CHEM 8055 Progress in Asymmetric Synthesis		
CHEM 8056 Chem-Genome Study		
CHEM 8081 The Chemistry of Carbon		
CHEM 8082 Synthesis and Characterization of Novel Inorganic Materials		
Total Hours		30

Total graduate credit hours required (minimum) at Fudan 30

Virginia Commonwealth University

Course	Title	Hours
Required didactic courses [1]		
Select three core courses of the following four areas: analytical, inorganic, organic and physical [2]		9
CHEM 504	Advanced Organic Chemistry I	
CHEM 510	Atomic and Molecular Structure [4]	
or CHEM 511	Chemical Thermodynamics and Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 63x or ENGR 691 (courses in analytical area) [3]		
Course completed twice		1
CHEM 698	Investigations in Current Chemistry Literature (0.5 credit hour) [5]	
Select five credit hours of recommended electives of the following, in consultation with adviser		5
BIOC 500-level (except BIOC 505, BIOC 506 and BIOC 507)		
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism	
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	
BIOC 602	Physical Properties of Macromolecules	
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
CHEB 601	Chemical Biology I	
CHEB 602	Chemical Biology II	
CHEM 500-level		
CHEM 604	Advanced Organic Chemistry II	
CHEM 605	Physical Organic Chemistry	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
CHEM 610	Applied Quantum Chemistry	
CHEM 611	Molecular Spectroscopy	
CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	
CHEM 615	Chemical Thermodynamics	
CHEM 616	Chemical Kinetics	
CHEM 620	Advanced Inorganic Chemistry I	
CHEM 621	Advanced Inorganic Chemistry II	
CHEM 630	Electroanalytical Chemistry	
CHEM 631	Separation Science	
CHEM 632	Chemometrics	
CHEM 633	Mass Spectrometry	
CHEM 634	Surface Science	
CHEM 635	Spectrochemical Analysis	
CHEM 691	Topics in Chemistry	
CHEM 698	Investigations in Current Chemistry Literature [5]	
ENGR 591	Special Topics in Engineering	
ENGR 691	Special Topics in Engineering	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
NANO 570	Nanoscale Physics	
NANO 571	Nanoscale Chemistry	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	

NANO 660	Theoretical Studies of Nanostructures	
NANO 661	Computational Nanoscience	
PHYS 550	Techniques in Material Research	
PHYS 573	Analytical Methods in Physics	
PHYS 576	Electromagnetic Theory	
PHYS 580	Quantum Mechanics	
PHYS 591	Topics in Physics	
PHYS 661	Surface and Materials Physics	
PHYS 691	Special Topics	
Other required courses		
CHEM 690	Research Seminar in Chemistry (credit hours variable) [6]	
CHEM 692	Chemistry Seminar Presentation [6]	2
CHEM 693	Chemistry Perspectives and Ethics [7]	1
CHEM 697	Directed Research [8]	12
Total Hours		30

1

Students must earn a minimum of 15 credit hours in six didactic graduate courses, not including credit hours for CHEM 690, CHEM 692, CHEM 693 or CHEM 697.

2

One of these courses may be waived upon satisfactory proficiency exam scores. The required number of credit hours for the degree does not change.

3

The ENGR 691 topics course must be materials characterization.

4

In some cases, students may be required to enroll in both CHEM 510 and CHEM 511 because of proficiency exam scores.

5

Students are expected to enroll in CHEM 698 (0.5 credit hour) twice during their graduate studies, including the semester preceding their literature seminar presentation (CHEM 692). Note: A maximum of two credit hours of CHEM 698 may be presented toward the didactic course graduation requirements to count as one course.

6

Students are expected to participate in the department's seminar program by enrolling in CHEM 690 or CHEM 692 every spring and fall semester. At least two formal talks are to be presented in the seminar program by enrolling twice in CHEM 692 (one credit hour).

7

Students are expected to enroll in CHEM 693 within their first year of enrollment.

8

Students are expected to enroll in CHEM 697 (one credit hour minimum) every spring and fall semester.

Total graduate credit hours required (minimum) at VCU 30

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Program website: chemistry.vcu.edu (http://chemistry.vcu.edu)

Nanoscience and Nanotechnology, Doctor of Philosophy (Ph.D.)

Program goals

1. In teaching, the purpose is to provide high quality education in chemistry and/or physics in preparation for professional careers in nanoscience and nanotechnology.
2. In research, the goals are to advance nanoscience research, to keep faculty on the forefront of the field and to maintain an educational program consistent with the latest technology and development of the discipline.

Student learning outcomes

1. Develop effective oral and written communication skills
2. Demonstrate expertise (breadth and depth) in nanoscience
3. Demonstrate appropriate ability to design and conduct experimental research
4. Demonstrate ability to analyze data critically and to design experiments independently
5. Develop competency in the responsible conduct of research

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Apr 15	GRE
	Spring	Oct 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the College of Humanities and Sciences, students are expected to have a bachelor's degree from an accredited college or university with 30 credit hours in chemistry, physics or engineering.

Admission on a provisional basis is possible for a student temporarily lacking the expected background. Acceptance is based upon undergraduate performance, satisfactory scores on the GRE and letters of recommendation.

Graduate students in the nanoscience and nanotechnology Ph.D. program may receive financial support via teaching or research assistantships or fellowships available from the home department.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students preparing for the Doctor of Philosophy degree in nanoscience and nanotechnology must earn a minimum of 72 credit hours consisting of core courses (nine credit hours), elective courses (nine credit hours), seminar (eight credit hours) and research (46 credit hours).

Before admission to candidacy for the Ph.D. degree, students must have

1. completed at least 12 credit hours of their required course work,
2. successfully completed cumulative exams and
3. successfully completed an oral candidacy examination based on a research proposal

The student will be required to complete a series of cumulative exams in the area of nanoscience and nanotechnology, which will normally occur during the student's second year in residence. After completion of the cumulative exams, an oral candidacy examination is then required to become a Ph.D. candidate. The oral examination, which is administered by the student's graduate dissertation committee, is based upon a written proposal describing the proposed dissertation research project. It is intended to evaluate the adequacy of the proposed project, the student's level of understanding of the project and the likelihood that the dissertation can be completed successfully.

Students must conduct a substantial original investigation under the supervision of their advisers and must submit to the graduate dissertation committee a written dissertation reporting the results of the research and analyzing its significance in relation to existing scientific knowledge. The oral dissertation defense, conducted under the direction of the dissertation committee, will examine the candidate's research, dissertation documentation and underlying fundamental knowledge encompassed by the candidate's research. Upon successful completion of the defense and the dissertation, the student may apply for graduation with the Ph.D. in Nanoscience and Nanotechnology. Full-time students should complete the degree requirements in four to five years.

Curriculum requirements

Course	Title	Hours
Core courses		
NANO 570	Nanoscale Physics	3
NANO 571	Nanoscale Chemistry	3
NANO 660	Theoretical Studies of Nanostructures	3
or NANO 650 & NANO 651	Experimental Techniques in Nanoscience I and Experimental Techniques in Nanoscience II	
Seminar		8
NANO 690	Research Seminar in Nanoscience and Nanotechnology (one credit hour taken six times)	
NANO 692	Nanoscience Seminar Presentation (one credit hour taken twice)	
Research		46
CHEM 697	Directed Research	
or PHYS 697	Directed Research	
Elective courses		
Select nine credit hours of the following, or other courses approved by program director:		9
CHEM 510	Atomic and Molecular Structure	

CHEM 511	Chemical Thermodynamics and Kinetics	
CHEM 580	Mechanical Properties of Plastics and Polymers	
CHEM 591	Topics in Chemistry	
CHEM 610	Applied Quantum Chemistry	
CHEM 611	Molecular Spectroscopy	
CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	
CHEM 634	Surface Science	
CHEM 635	Spectrochemical Analysis	
CHEM 691	Topics in Chemistry	
CLSE 645	Biosensors and Bioelectronic Devices	
CLSE 675	Polymers in Medicine	
EGRB 613	Biomaterials	
EGRE 525	Fundamentals of Photonics Engineering	
EGRE 621	Spintronics	
EGRE 623		
ENGR 691	Special Topics in Engineering	
PHYS 550	Techniques in Material Research	
PHYS 580	Quantum Mechanics	
PHYS 591	Topics in Physics	
PHYS 641	Solid State Physics	
PHYS 661	Surface and Materials Physics	
PHYS 691	Special Topics	
Total Hours		72

Total graduate credit hours required (minimum) 72

Students will attend NANO 690 Research Seminar in Nanoscience and Nanotechnology throughout their degree programs, receiving an S (satisfactory) or U (unsatisfactory) grade based on attendance and participation. Students will also give two seminar presentations, one on a literature topic and one on their dissertation research, which will be graded on the A/B/C/D/F scale.

Graduate program director
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Program website: nano.vcu.edu (http://nano.vcu.edu)

Department of English

David E. Latané, Ph.D.
Professor and chair

Sachi Shimomura, Ph.D.
Associate professor and associate chair

Gretchen Comba
Teaching associate professor and director of undergraduate studies

Les Harrison, Ph.D.
Associate professor and director of the M.A. program

David Wojahn
Professor and director of the creative writing program

Eric Garberson, Ph.D.
Associate professor of art history and director of the MATX program

english.vcu.edu (http://www.english.vcu.edu)

The purpose of the Department of English is to teach students to see their worlds with clarity and respond to them with sensitivity, through reading and writing. Students are invited to read and explore a diversity of texts created in different times and voices and then to respond to these texts variously and critically, situating them within their contexts and discerning their important aesthetic features, rhetorical elements and social functions.

Students in this department also are encouraged to express themselves in expository or imaginative works that engage thought and feeling, evince purpose clearly, marshal appropriate evidence and observe principles of rhetorical decorum.

The Department of English offers a Bachelor of Arts in English, as well as minors in American studies, British studies, English (for non-English majors) and creative writing, the Master of Arts in English and the Master of Fine Arts in Creative Writing, and a doctoral program leading to a Ph.D. in Media, Art, and Text. Use the program index links to view individual program descriptions and curricula, or visit the department's website at english.vcu.edu (http://www.english.vcu.edu) for additional information.

- Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in dual genre (p. 250)
- Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in fiction (p. 253)
- Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in poetry (p. 255)
- English, Master of Arts (M.A.) (p. 257)
- English, Master of Arts (M.A.) with a concentration in research (p. 259)
- Media, Art, and Text, Doctor of Philosophy (Ph.D.) (p. 260)

Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in dual genre

Program goals

Our selective and academically rigorous 48-credit-hour, three-year program is designed to provide talented writers with the opportunity to work closely with both outstanding faculty and gifted peers to strengthen their craft, develop their literary aesthetics, enrich their understanding of existing traditions as well as compositional possibilities, and to participate actively in the life of the literary community at large.

The primary areas of study are poetry and fiction, and admission is highly competitive. In addition to the poetry and fiction workshops, there are courses available that focus on writing drama, nonfiction and screenplays, as well as courses that provide practical experience in editing.

Student learning outcomes

Students in the M.F.A. in Creative Writing program will:

1. Develop and refine their individual writerly voices, produce literary work of a high quality and demonstrate a comprehensive understanding of their own aesthetics, as well as the literary models and cultural sources of those aesthetics
2. Actively engage in a wider literary culture and community at the local, regional, national or international level
3. Develop constructive workshop practices and demonstrate the ability to read closely and respond perceptively and critically to the writing of their fellow M.F.A. students
4. Develop an advanced comprehension of editing and revision techniques and strategies, which include synthesizing challenges, advice and critiques from professors and fellow M.F.A. students
5. Develop, hone and articulate a keen sense of their artistic and career goals

Student learning outcomes specific to fiction

1. Demonstrate the use or knowledge of effective approaches for creating sustained works of fiction distinguished by a nuanced use of appropriate narrative elements, techniques and conventions
2. Demonstrate a highly developed proficiency in understanding and creating story structures appropriate to their purpose and audience, as well as to their chosen literary modes and styles
3. In a statement of purpose or aesthetics that is part of their thesis manuscripts, as well as in an exit interviews/thesis defense, appraise and locate their own work within literary and cultural contexts

Student learning outcomes specific to poetry

1. Demonstrate a skillful use or knowledge of major poetic devices, such as metaphor, imagery, lineation, persona, types of rhythm, rhyme and other sonic effect.
2. Demonstrate the use or knowledge of classic poetic forms, such as the sonnet, the ode and the elegy, as well as other contemporary, experimental or avant-garde forms.
3. In a statement of purpose or aesthetics that is part of their thesis manuscript, as well as in an exit interview/ thesis defense, appraise and locate their own work within literary and cultural contexts

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

M.F.A. Guide may be accessed online at english.vcu.edu/mfa/mfa-guide (http://english.vcu.edu/mfa/mfa-guide).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 1 (Jan 15 for consideration of assistantship)	

Special requirements

- Portfolio (see below)

The Master of Fine Arts in Creative Writing program is designed to attract students from diverse undergraduate backgrounds who are writers of promise. The program is suited particularly to those interested primarily in the writing of fiction and poetry; however, some emphasis also is placed on nonfiction writing, playwriting and screenwriting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A portfolio of promising fiction or poetry, possibly with drama (as a minimum, approximately eight to 10 poems, or 20 or more pages of fiction or some combination of these; in all cases, applicants should submit only their strongest creative writing samples) to be submitted directly to the M.F.A. program
2. Three recommendations from persons who are qualified to give information concerning the applicant's probable success in graduate school, especially in a creative writing program
3. A scholastic record that is indicative of the applicant's ability to pursue a graduate degree successfully
4. A baccalaureate degree or its equivalent from an accredited institution

Should students wish to be considered for a possible graduate teaching assistantship, they must also complete a separate Graduate Teaching Assistantship Application (pdf) (http://wp.vcu.edu/english-new/wp-content/uploads/sites/4432/2014/03/GA_application.pdf), which can be found on the program's website. This separate/additional application also requires an undergraduate, graduate or professional paper, as well as a brief personal essay (two to three pages) in which applicants discuss their relevant teaching experience, educational background and particular interest in a graduate degree, suggesting where their education seems to be leading.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.F.A. in Creative Writing program are required to earn a minimum of 48 graduate-level credit hours beyond the baccalaureate. At least half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Beyond the required courses, students should select elective courses, in conjunction with the program director or their thesis advisers, which are appropriate to their aims and interests. The thesis work gives students the opportunity to produce manuscripts of publishable quality. Course work also is available in the techniques of teaching creative writing, and the program is flexible enough to include studies undertaken in other departments of the university as well, including the departments of Art History, Theatre and Philosophy and the Richard T. Robertson School of Media and Culture.

Curriculum requirements

Course	Title	Hours
Workshops		
Select four of the following (majority of course work should be in the student's genre):		12
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
Elective courses in literature		
Select four of the following:		12
ENGL/TEDU 528	Children's Literature II	
ENGL 560	Studies in British Literature and Culture	
ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
ENGL 606	Literary Criticism	
ENGL 611	Authors	
ENGL 614	Cultural Discourses	
ENGL 620	Intertextuality	
ENGL 624	Texts and Contexts	
ENGL 627	Genres	
ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	
ENGL 692	Independent Study	
Additional recommended electives		
Select 18 credit hours of the following (may include up to three additional credit hours of thesis):		18
ENGL/TEDU 528	Children's Literature II	
ENGL/ENED 532	Applied English Linguistics	
ENGL 550	Studies in Linguistics	
ENGL/TEDU/LING 552	Teaching English as a Second Language	
ENGL 560	Studies in British Literature and Culture	
ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
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ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	
ENGL 632	Community Writing	
ENGL 636	Teaching Writing	
ENGL 637	Theories of Rhetoric and Composition	
ENGL 638	Responding to Writing	
ENGL 652	Studies in Writing and Rhetoric: ____	
ENGL 661	Themes in Interdisciplinary Studies	
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 670	Literary Editing and Publishing	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	

ENGL 673	Teaching Creative Writing	
ENGL 692	Independent Study	
ENGL 694	Internship in Writing	
ENGL 798	Thesis	
Thesis		
ENGL 798	Thesis (credit hours variable; may be repeated)	6
Total Hours		48

Total graduate credit hours required (minimum) 48

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Phone: (804) 828-1329

Program website: english.vcu.edu/mfa (http://english.vcu.edu/mfa)

Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in fiction

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Our selective and academically rigorous 48-credit-hour, three-year program is designed to provide talented writers with the opportunity to work closely with both outstanding faculty and gifted peers to strengthen their craft, develop their literary aesthetics, enrich their understanding of existing traditions as well as compositional possibilities, and to participate actively in the life of the literary community at large.

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Curriculum requirements

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ENGL 668	Creative Writing: Drama	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
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Select four of the following:		12
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ENGL 638	Responding to Writing	
ENGL 652	Studies in Writing and Rhetoric: ____	
ENGL 661	Themes in Interdisciplinary Studies	
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 670	Literary Editing and Publishing	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
ENGL 673	Teaching Creative Writing	
ENGL 692	Independent Study	
ENGL 694	Internship in Writing	
ENGL 798	Thesis	
Thesis		
ENGL 798	Thesis (credit hours variable; may be repeated)	6
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
David Wojahn
Professor, Department of English
Email: dcwojahn@vcu.edu
Phone: (804) 828-4462

Additional contact
Thom Didato
Graduate programs adviser, Department of English
Email: tndidato@vcu.edu
Phone: (804) 828-1329

Program website: english.vcu.edu/mfa (http://english.vcu.edu/mfa)

Creative Writing, Master of Fine Arts (M.F.A.) with a concentration in poetry

Program goals

Our selective and academically rigorous 48-credit-hour, three-year program is designed to provide talented writers with the opportunity to work closely with both outstanding faculty and gifted peers to strengthen their craft, develop their literary aesthetics, enrich their understanding of existing traditions as well as compositional possibilities, and to participate actively in the life of the literary community at large.

The primary areas of study are poetry and fiction, and admission is highly competitive. In addition to the poetry and fiction workshops, there are courses available that focus on writing drama, nonfiction and screenplays, as well as courses that provide practical experience in editing.

Student learning outcomes

Students in the M.F.A. in Creative Writing program will:

1. Develop and refine their individual writerly voices, produce literary work of a high quality and demonstrate a comprehensive understanding of their own aesthetics, as well as the literary models and cultural sources of those aesthetics
2. Actively engage in a wider literary culture and community at the local, regional, national or international level
3. Develop constructive workshop practices and demonstrate the ability to read closely and respond perceptively and critically to the writing of their fellow M.F.A. students
4. Develop an advanced comprehension of editing and revision techniques and strategies, which include synthesizing challenges, advice and critiques from professors and fellow M.F.A. students
5. Develop, hone and articulate a keen sense of their artistic and career goals

Student learning outcomes specific to poetry

1. Demonstrate a skillful use or knowledge of major poetic devices, such as metaphor, imagery, lineation, persona, types of rhythm, rhyme and other sonic effect.
2. Demonstrate the use or knowledge of classic poetic forms, such as the sonnet, the ode and the elegy, as well as other contemporary, experimental or avant-garde forms.
3. In a statement of purpose or aesthetics that is part of their thesis manuscript, as well as in an exit interview/ thesis defense, appraise and locate their own work within literary and cultural contexts

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

M.F.A. Guide may be accessed online at english.vcu.edu/mfa/mfa-guide (http://english.vcu.edu/mfa/mfa-guide).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 1 (Jan 15 for consideration of assistantship)	

Special requirements

- Portfolio (see below)

The Master of Fine Arts in Creative Writing program is designed to attract students from diverse undergraduate backgrounds who are writers of promise. The program is suited particularly to those interested primarily in the writing of fiction and poetry; however, some emphasis also is placed on nonfiction writing, playwriting and screenwriting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A portfolio of promising fiction or poetry, possibly with drama (as a minimum, approximately eight to 10 poems, or 20 or more pages of fiction or some combination of these; in all cases, applicants should submit only their strongest creative writing samples) to be submitted directly to the M.F.A. program
2. Three recommendations from persons who are qualified to give information concerning the applicant's probable success in graduate school, especially in a creative writing program
3. A scholastic record that is indicative of the applicant's ability to pursue a graduate degree successfully
4. A baccalaureate degree or its equivalent from an accredited institution

Should students wish to be considered for a possible graduate teaching assistantship, they must also complete a separate Graduate Teaching Assistantship Application (pdf) (http://wp.vcu.edu/english-new/wp-content/uploads/sites/4432/2014/03/GA_application.pdf), which can be found on the program's website. This separate/additional application also requires an undergraduate, graduate or professional paper, as well as a brief personal essay (two to three pages) in which applicants discuss their relevant teaching experience, educational background and particular interest in a graduate degree, suggesting where their education seems to be leading.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.F.A. in Creative Writing program are required to earn a minimum of 48 graduate-level credit hours beyond the baccalaureate. At least half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Beyond the required courses, students should select elective courses, in conjunction with the program director or their thesis advisers, which are appropriate to their aims and interests. The thesis work gives students the opportunity to produce manuscripts of publishable quality. Course work also is available in the techniques of teaching creative writing, and the program is flexible enough to include studies undertaken in other departments of the university as well, including the departments of Art History, Theatre and Philosophy and the Richard T. Robertson School of Media and Culture.

Curriculum requirements

Course	Title	Hours
Workshops		
Select four of the following (majority of course work should be in the student's genre):		12
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
Elective courses in literature		
Select four of the following:		12
ENGL/TEDU 528	Children's Literature II	
ENGL 560	Studies in British Literature and Culture	

ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
ENGL 606	Literary Criticism	
ENGL 611	Authors	
ENGL 614	Cultural Discourses	
ENGL 620	Intertextuality	
ENGL 624	Texts and Contexts	
ENGL 627	Genres	
ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	
ENGL 692	Independent Study	
Additional recommended electives		
Select 18 credit hours of the following (may include up to three additional credit hours of thesis):		18
ENGL/TEDU 528	Children's Literature II	
ENGL/ENED 532	Applied English Linguistics	
ENGL 550	Studies in Linguistics	
ENGL/TEDU/LING 552	Teaching English as a Second Language	
ENGL 560	Studies in British Literature and Culture	
ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
ENGL 606	Literary Criticism	
ENGL 611	Authors	
ENGL 614	Cultural Discourses	
ENGL 620	Intertextuality	
ENGL 624	Texts and Contexts	
ENGL 627	Genres	
ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	
ENGL 632	Community Writing	
ENGL 636	Teaching Writing	
ENGL 637	Theories of Rhetoric and Composition	
ENGL 638	Responding to Writing	
ENGL 652	Studies in Writing and Rhetoric: ____	
ENGL 661	Themes in Interdisciplinary Studies	
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 670	Literary Editing and Publishing	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
ENGL 673	Teaching Creative Writing	
ENGL 692	Independent Study	
ENGL 694	Internship in Writing	
ENGL 798	Thesis	
Thesis		
ENGL 798	Thesis (credit hours variable; may be repeated)	6
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
David Wojahn
Professor, Department of English
Email: dcwojahn@vcu.edu
Phone: (804) 828-4462

Additional contact
Thom Didato
Graduate programs adviser, Department of English
Email: tndidato@vcu.edu
Phone: (804) 828-1329

Program website: english.vcu.edu/mfa (http://english.vcu.edu/mfa)

English, Master of Arts (M.A.)

Program goals

The Department of English offers an M.A. degree for students seeking study beyond a bachelor's degree which prepares graduates to pursue a doctorate, to teach in secondary or higher education or to obtain other positions in the public and private sector. The M.A. in English is designed for students pursuing advanced English studies, and students may choose to focus their course work in either literature or writing and rhetoric. The M.A. in English with a research concentration is designed for students pursuing advanced English studies with an emphasis on research, criticism and methodology.

Student learning outcomes

1. Develop advanced reading and writing skills
2. Engage in theoretical and/or textual/bibliographical scholarship
3. Conduct original research and advance an original argument under faculty direction
4. Explain and defend original research in a formal presentation or defense
5. Survey the professional and academic work to which the degree leads

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the

University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Mar 1	GRE-General
	Spring	Oct 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A baccalaureate degree in an area appropriate to the study of literature or writing
2. A GPA that indicates the applicant can successfully pursue a graduate degree
3. Three letters of recommendation from former instructors
4. Completion of the general GRE
5. A writing sample, optimally ranging from 10-15 double-spaced pages

Should students wish to be considered for a possible graduate teaching assistantship, they must also complete a separate Graduate Teaching Assistantship Application (pdf) (http://wp.vcu.edu/english-new/wp-content/uploads/sites/4432/2014/03/GA_application.pdf), which can be found on the program's website. This separate/additional application also requires an undergraduate, graduate or professional paper, as well as a brief personal essay (two to three pages) in which applicants discuss their relevant teaching experience, educational background and particular interest in a graduate degree, suggesting where their education seems to be leading.

Applicants may also indicate whether they intend to write a thesis and with which faculty members they hope to study.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.A. in English program are required to earn a minimum of 30 graduate credit hours beyond the baccalaureate. At least half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Students must complete one of two final projects: either a directed study, under the supervision of a faculty member with a public presentation; or a thesis in consultation with a faculty committee, which culminates in an oral defense. Students must obtain approval for their final projects from their supervising faculty and the M.A. committee.

Curriculum requirements

Course	Title	Hours
Course requirements		
ENGL 501	Introduction to Graduate Studies in English	1
ENGL 605	Introduction to Scholarship in English Studies	3
or ENGL 606	Literary Criticism	
ENGL 695	Directed Study/Major Project and Presentation	1-3
Recommended electives		
Select 23-25 credit hours of the following:		23-25
ENGL/TEDU 528	Children's Literature II	
ENGL/ENED 532	Applied English Linguistics	
ENGL 550	Studies in Linguistics	
ENGL/TEDU/LING 552	Teaching English as a Second Language	
ENGL 560	Studies in British Literature and Culture	
ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
ENGL 606	Literary Criticism	
ENGL 611	Authors	
ENGL 614	Cultural Discourses	
ENGL 620	Intertextuality	
ENGL 624	Texts and Contexts	
ENGL 627	Genres	
ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	

ENGL 632	Community Writing
ENGL 636	Teaching Writing
ENGL 637	Theories of Rhetoric and Composition
ENGL 638	Responding to Writing
ENGL 652	Studies in Writing and Rhetoric: ____
ENGL 661	Themes in Interdisciplinary Studies
ENGL 666	Creative Writing: Fiction
ENGL 667	Creating Writing: Poetry
ENGL 668	Creative Writing: Drama
ENGL 670	Literary Editing and Publishing
ENGL 671	Film and Television Scripts
ENGL 672	Writing Nonfiction
ENGL 692	Independent Study
ENGL 694	Internship in Writing

Total graduate credit hours required (minimum) 30

Graduate program director
Les Harrison, Ph.D.
Associate professor
Email: hlharrison@vcu.edu
Phone: (804) 828-1331

Additional contact
Thom Didato
Graduate programs adviser
Email: tndidato@vcu.edu
Phone: (804) 828-1329

Program website: english.vcu.edu/ma (http://english.vcu.edu/ma)

English, Master of Arts (M.A.) with a concentration in research

Program goals

The Department of English offers an M.A. degree for students seeking study beyond a bachelor's degree which prepares graduates to pursue a doctorate, to teach in secondary or higher education or to obtain other positions in the public and private sector. The M.A. in English is designed for students pursuing advanced English studies, and students may choose to focus their course work in either literature or writing and rhetoric. The M.A. in English with a research concentration is designed for students pursuing advanced English studies with an emphasis on research, criticism and methodology.

Student learning outcomes

1. Develop advanced reading and writing skills
2. Engage in theoretical and/or textual/bibliographical scholarship
3. Conduct original research and advance an original argument under faculty direction
4. Explain and defend original research in a formal presentation or defense
5. Survey the professional and academic work to which the degree leads

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Mar 1	GRE-General
	Spring	Oct 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A baccalaureate degree in an area appropriate to the study of literature or writing
2. A GPA that indicates the applicant can successfully pursue a graduate degree
3. Three letters of recommendation from former instructors
4. Completion of the GRE
5. A writing sample, optimally ranging from 10-15 double-spaced pages

Should students wish to be considered for a possible graduate teaching assistantship, they must also complete a separate Graduate Teaching Assistantship Application (pdf) (http://wp.vcu.edu/english-new/wp-content/uploads/sites/4432/2014/03/GA_application.pdf), which can be found on the program's website. This separate/additional application also requires an undergraduate, graduate or professional paper, as well as a brief personal essay (two to three pages) in which applicants discuss their relevant teaching experience, educational background and particular interest in a graduate degree, suggesting where their education seems to be leading.

Applicants may also indicate whether they intend to write a thesis and with which faculty members they hope to study.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.A. in English program are required to earn a minimum of 30 graduate credit hours beyond the baccalaureate. At least half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Students must complete one of two final projects: either a directed study, under the supervision of a faculty member with a public presentation; or a thesis in consultation with a faculty committee, which culminates in an oral defense. Students must obtain approval for their final projects from their supervising faculty and the M.A. committee.

Curriculum requirements

Course	Title	Hours
Course requirements		
ENGL 501	Introduction to Graduate Studies in English	1
ENGL 605	Introduction to Scholarship in English Studies	3
ENGL 606	Literary Criticism	3
ENGL 799	Thesis (credit hours variable; may be repeated)	6
Recommended electives		
Select 17 credit hours of the following:		17
ENGL/TEDU 528	Children's Literature II	
ENGL/ENED 532	Applied English Linguistics	
ENGL 550	Studies in Linguistics	
ENGL/TEDU/LING 552	Teaching English as a Second Language	
ENGL 560	Studies in British Literature and Culture	
ENGL 570	Special Topics in American Literature and Culture	
ENGL/ENED 601	Young Adult Literature	
ENGL 605	Introduction to Scholarship in English Studies	
ENGL 606	Literary Criticism	
ENGL 611	Authors	
ENGL 614	Cultural Discourses	
ENGL 620	Intertextuality	
ENGL 624	Texts and Contexts	
ENGL 627	Genres	
ENGL 629	Form and Theory of Poetry	
ENGL 630	Form and Theory of Fiction	
ENGL 631	Form and Theory of Creative Nonfiction	
ENGL 632	Community Writing	
ENGL 636	Teaching Writing	
ENGL 637	Theories of Rhetoric and Composition	
ENGL 638	Responding to Writing	
ENGL 652	Studies in Writing and Rhetoric: ____	
ENGL 661	Themes in Interdisciplinary Studies	
ENGL 666	Creative Writing: Fiction	
ENGL 667	Creating Writing: Poetry	
ENGL 668	Creative Writing: Drama	
ENGL 670	Literary Editing and Publishing	
ENGL 671	Film and Television Scripts	
ENGL 672	Writing Nonfiction	
ENGL 692	Independent Study	
ENGL 694	Internship in Writing	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Les Harrison, Ph.D.
Associate professor
Email: hlharrison@vcu.edu
Phone: (804) 828-1331

Additional contact
Thom Didato
Graduate programs adviser
Email: tndidato@vcu.edu
Phone: (804) 828-1329

Program website: english.vcu.edu/ma (http://english.vcu.edu/ma)

Media, Art, and Text, Doctor of Philosophy (Ph.D.) [Department of English]

Program goal

VCU's interdisciplinary doctoral program in media, art, and text is a joint endeavor of the Department of English, the School of the Arts and the Richard T. Robertson School of Media and Culture. The program prepares students primarily to teach at the college or university level, although some pursue careers in related media fields. MATX emphasizes

the historical and theoretical foundations essential to the scholarly study of media, both old and new, broadly defined. It provides an intellectually stimulating environment that encourages students to work both collaboratively and independently, as well as across and between disciplines and media. Students maintain a base in their primary area of research, which is usually but not always the field in which they have done prior graduate work.

Student learning outcomes

1. Develop advanced communication skills in writing, speaking and the use of multimedia
2. Demonstrate broad knowledge of history and theory as the foundation for interdisciplinary work in a specialized facet of media, art, and/or text
3. Develop competence in interdisciplinary and disciplinary research methods and responsible conduct of research
4. Develop specialized knowledge in relevant fields to support dissertation and subsequent research
5. Demonstrate the ability to conduct independent research and produce new, specialized knowledge within the broad parameters of media, art, and text
6. Develop a strong basis for ongoing professional practice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

The MATX student handbook is available at **matx.vcu.edu/program/handbook**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 2	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must hold a master's degree (M.A., M.F.A., M.S.) in a relevant field.
2. Applicants must submit the following, in the formats indicated via VCU's online application portal..
   a. Writing sample demonstrating the ability to write clearly, analyze effectively and conduct original research in advanced doctoral-level seminars – This may be a master's thesis, a graduate-level seminar paper or a published essay. Submit as a PDF.
   b. Statement of purpose describing the applicant's interest, motivation and goals in pursuing this degree – The statement should specifically address the importance of interdisciplinarity to the applicant's academic goals, and it should also offer evidence of preparation for the study of media, art, and text. The applicant should indicate the specific area of study and research to be pursued at VCU and identify faculty who might potentially direct dissertation research. Submit as a PDF.
   c. Academic curriculum vitae or professional resume – List all colleges and universities attended and degrees earned, all professional and academic positions held, all publications and/or exhibitions, technical skills, and any other relevant information. Include URLs for personal and/or professional websites. Submit as PDF.
   d. Letters of recommendation – Provide letters from three present or former instructors or other individuals qualified to evaluate the applicant's ability to engage in interdisciplinary study at the doctoral level. Have recommenders submit their letters via the online application portal.
3. Applicants who wish to pursue creative work at VCU must also submit a portfolio. Those with an M.F.A. who do not wish to continue creative work should consult with the MATX director about this requirement. Materials submitted should demonstrate excellence in

studio or professional practice and the potential to do graduate-level work in media, art, and text. Portfolios will be reviewed by the MATX admissions committee as well as relevant faculty in the School of the Arts and the Richard T. Robertson School of Media and Culture. Please observe the following guidelines:

a. Those working in 2-D or 3-D mediums should provide 20 images of representative work arranged chronologically, beginning with the most recent.
b. Those working in sound and time-based media, as well as those in the performing arts, should provide clips totaling no more than 10 minutes.
c. Those working across media may submit a combination of the above.
d. The portfolio should include title, date, media and dimensions of each work, as well as a brief statement or other information that will help the admissions committee in its evaluation.

   Small files illustrating 2-D or 3-D work should be submitted in a single PDF. Sound or video files should be posted to Vimeo or Sound Cloud with a functioning link submitted in a PDF with the required information posted to the portal. Portfolio materials may also be posted to a personal or professional website and the link submitted in a PDF posted to the portal.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the MATX program are required to earn a minimum of 42 graduate-level credit hours beyond the master's. At least one-half of the credit hours presented for graduation must be at the 600 level or higher. The 42-hour curriculum comprises 36 hours of course work and a minimum of six hours of dissertation research. Course work includes a core of four required courses taken during the first two semesters by all incoming students. Three doctoral seminars provide a shared historical and theoretical foundation for the study of media, art, and text, while a workshop offers the opportunity to develop and expand professional and/or creative skills relevant to the student's career goals and research focus. In addition, all students will take a research methods course in a field relevant to their anticipated area of dissertation research. Beyond the core, students select 21 hours of elective credit hours from course offerings in disciplines relevant to their research interests and career goals. The program offers a topics seminar focused on the history, theory or practice of media, art, and text. Independent study and internships are also available as electives. While enrollment in courses with the MATX prefix is guaranteed to matriculated MATX students, enrollment in other graduate courses is subject to the conditions established by individual units. Together the core and the electives support the interdisciplinary work of the dissertation, which is an original scholarly examination of some aspect of media, art, and/or text. It may include work in media other than text. It is supervised by a committee consisting of four or five members drawn from disciplines relevant to the research topic.
2. Grade requirements: To graduate, degree applicants must achieve an overall grade point average of 3.0 (B) on a 4.0 scale with a grade of C in no more than two courses. The GPA for graduation will be based on all graduate courses attempted after acceptance into the program.
3. Requirements for admission to candidacy: Before beginning formal dissertation research, students must complete all 36 hours of required course work, both stages of the e-portfolio and the requirements described below. Upon completion of these, the student will apply for degree candidacy.
4. Dissertation committee: The dissertation committee consists of the director (who must hold a Ph.D.) and three or four additional members whose scholarly knowledge and interests are relevant to the project. The committee must have at least one member from each of the sponsoring units (Department of English, School of the Arts, Richard T. Robertson School of Media and Culture). All must be members of VCU's graduate faculty. Appropriate faculty from outside VCU may serve on committees (but not as director) with the approval of the MATX director and the graduate dean. It is the student's responsibility to assemble the committee, in consultation with the dissertation director. Committees will not be appointed by the program.
5. E-portfolio: Work on the e-portfolio will begin in MATX 604 in the spring of the first year. There are no technical specifications, and content will include, but is not limited to, work done in the first two years in the program. It will take the form of a website and must demonstrate the technical skills (Web design, audio, video, etc.) relevant to the student's work on the dissertation and the career sought after VCU. Submission is a two-stage process:
   a. Stage 1 (August of the second year): a three- to five-page design rationale for the portfolio site along with a mock-up or rough structure
   b. Stage 2 (April of the second year): a finished, live site accompanied by a five-page statement relating it to the student's work inside and outside the program and outlining how it uses media techniques to promote a specific professional and/or creative identity (Note: Each submission is graded pass/fail and may be repeated once. A second failure results in automatic termination from the program.)
6. Competency: Candidates must demonstrate competency in a skill or technique relevant to the dissertation research or planned professional career. The dissertation committee approves and administers the competency portion. Graded pass/fail, the test may be repeated once.
7. Bibliography exam: Candidates will complete an exam on a reading list of 20 to 30 sources relevant to or supportive of the dissertation topic. The dissertation committee approves and administers the bibliography exam. Graded pass/fail, the test may be repeated once.
8. Dissertation prospectus and prospectus defense: The prospectus is a 15- to 20-page document that indicates the significance of the proposed research, gives a short review of relevant literature, states the research question, specifies the proposed methodology and indicates how the project lays the foundation for the anticipated academic or professional career. It also includes a work plan for the completion of research and writing, as well as a complete bibliography. The prospectus is defended orally before the dissertation committee, which may accept, reject or require revisions. The defense may be repeated once.
9. Dissertation and dissertation defense: The dissertation is an original, interdisciplinary and scholarly examination of a topic relevant to an aspect of media, art, and/or text. It may include work in media other than text. Given the varied nature of doctoral research, there is no set time frame for completion of a dissertation. It is expected, however, that the dissertation will take about two years after attaining candidacy, but it must be defended within the eight-year time limit for completion of the doctoral degree. The dissertation will be defended

orally before the dissertation committee. Successful defense of the dissertation completes the requirements for the degree.

Curriculum requirements

Course	Title	Hours
MATX 601	Texts and Textuality	3
MATX 602	History of Media, Art, and Text	3
MATX 603	Mass Media	3
MATX 604	Interdisciplinary Workshop	3
MATX 897	Dissertation Project	6
Select one methods course from list 1 below		3
Select elective courses from list 2 below [1]		21
Total Hours		42

[1]

Elective courses other than those listed may be taken with approval of the MATX program director and the offering department.

Total graduate credit hours required (minimum) 42

List 1: Methods courses

Course	Title	Hours
ARTH 690	Historiography and Methodology of Art History	3
ENGL 605	Introduction to Scholarship in English Studies	3
GSWS 602	Feminist Research Epistemology and Methods	3
MASC 611	Research Methods in Mass Communications	3

List 2: Recommended electives

Course	Title	Hours
ARTH 591	Special Topics in Art History	1-6
ARTH 690	Historiography and Methodology of Art History	3
ARTH 722	Seminar in 19th-century Art	3
ARTH 723	Seminar in 20th-century Art	3
ARTH 741	Seminar in Art and Theory	3
ARTH 742	Seminar in Trans-millennial Art and Ideas	3
ARTH 743	Seminar in Art and Representation	3
ARTH 791	Special Topics in Art History	3
ENGL 560	Studies in British Literature and Culture	3
ENGL 570	Special Topics in American Literature and Culture	3
ENGL 605	Introduction to Scholarship in English Studies	3
ENGL 611	Authors	3
ENGL 614	Cultural Discourses	3
ENGL 620	Intertextuality	3
ENGL 624	Texts and Contexts	3
ENGL 627	Genres	3
ENGL 629	Form and Theory of Poetry	3
ENGL 630	Form and Theory of Fiction	3
ENGL 631	Form and Theory of Creative Nonfiction	3
ENGL 661	Themes in Interdisciplinary Studies	3
GSWS 501	Feminist Theory	3
GSWS 602	Feminist Research Epistemology and Methods	3
GSWS 620	Theorizing Sexuality	3
GSWS 624	Gender and Cultural Production	3
GSWS 691	Topics in Gender, Sexuality and Women's Studies	1-3
KINE 591	Topics in Contemporary Media	3
KINE 690	Graduate Seminar	4
KINE 695	Advanced Sound	3
MASC 611	Research Methods in Mass Communications	3
MASC 645	Visual Journalism	3
MASC 684	Multiplatform Storytelling	3
MASC 688	Converged Media Applications	3
MASC 691	Topics in Mass Communications	1-3
MATX 690	Seminar in Media, Art, and Text	3
MATX 696	Internship	1-3
MATX 791	Directed Study (may be taken for a maximum of 12 credit hours)	1-3

Graduate program director

Eric G. Garberson, Ph.D.
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Additional contact
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tndidato@vcu.edu
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Program website: matx.vcu.edu (http://matx.vcu.edu)

Department of Forensic Science

Rima Franklin, Ph.D.
Associate professor and interim chair

Catherine Connon, Ph.D.
Instructor and undergraduate program director

Sarah Williams, Ph.D.
Assistant professor and graduate program director

forensicscience.vcu.edu (http://forensicscience.vcu.edu)

The Department of Forensic Science offers programs leading to bachelor's and master's degrees.

The Bachelor of Science is for students who plan a career or graduate study in the forensic sciences. The forensic science program provides students with fundamental learning in forensic laboratory analyses and crime scene investigation, with academic emphasis in biology, chemistry and criminal justice. The program offers three concentrations: forensic biology, forensic chemistry and physical evidence. Students will select

one of the three concentrations prior to the second semester of their sophomore year. The B.S. in Forensic Science supplies students with the necessary skills for professional careers in forensic laboratories, public and private, basic research laboratories, clinical laboratories, and/or to pursue graduate studies. Students also will be prepared to pursue advanced degrees in the physical sciences, biological sciences, forensic science, law, allied health and medicine, to name a few.

The Master of Science in Forensic Science prepares students for careers as forensic scientists in government and private laboratories. Students receive in-depth exposure to specializations within the field, including drug analysis, DNA analysis, trace evidence, criminalistics and legal issues.

For more information visit forensicscience.vcu.edu (http://forensicscience.vcu.edu).

- Forensic Science, Master of Science (M.S.) with a concentration in forensic biology (p. 264)
- Forensic Science, Master of Science (M.S.) with a concentration in forensic chemistry/drugs and toxiciology (p. 266)
- Forensic Science, Master of Science (M.S.) with a concentration in forensic chemistry/trace (p. 269)
- Forensic Science, Master of Science (M.S.) with a concentration in forensic physical analysis (p. 271)

Forensic Science, Master of Science (M.S.) with a concentration in forensic biology

Program accreditation
Forensic Science Education Programs Accreditation Commission

Program goal

The Master of Science in Forensic Science is one of only a few of its kind in the U.S. The mission of the program is to prepare students for careers as forensic scientists in government and private forensic laboratories. In addition, students will be prepared to pursue further graduate and/or professional academic degrees.

Core courses in the forensic science curriculum offer broad exposure to forensic laboratory equipment and instrumentation, as well as legal issues, expert testimony, forensic biology, forensic chemistry, trace evidence, physical evidence, professional ethics, quality assurance and current topics in research and development within the forensic sciences. Students entering the program will be required to select a concentration by the end of the first semester. Concentrations offered include forensic biology, forensic chemistry/drugs and toxicology, forensic chemistry/trace and forensic physical analysis. A strong emphasis is placed on laboratory course work, providing students with significant laboratory and research experience. Several of the laboratory courses are taught by practicing professional forensic scientists at the Virginia Division of Forensic Science Central Laboratory, which is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

Student learning outcomes

1. Students will be able to apply basic principles and laboratory procedures of biology and chemistry to forensic science through focused study in the available concentration options.
2. Students will demonstrate capabilities, use, potential and limitations of forensic laboratory theory and techniques.
3. Students will demonstrate the ability to perform (report and orally present) independent research in an area of forensic science.
4. Students will demonstrate an understanding of legal procedure, rules of evidence, ethical and professional duties and responsibilities of the forensic scientist.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The forensic science graduate student handbook is available at forensicscience.vcu.edu/graduate/student-handbook (http://forensicscience.vcu.edu/graduate/student-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE

Note: Review of application and offers of admission will begin Jan. 15 and proceed until enrollment openings are filled. All applicants are automatically considered for graduate teaching assistantships in the Department of Forensic Science; however, the earlier a student's application is complete, the better the chance of being selected for an assistantship.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in a natural science discipline, including forensic science, or a degree with equivalent course work
2. An undergraduate GPA that exceeds 2.9 on a 4.0 scale (Most students entering the forensic science graduate program have a minimum GPA of 3.0 on undergraduate work and a combined score of 300 or more on the verbal and quantitative sections of the GRE
3. Completion of eight credit hours (two semesters or equivalent) of organic chemistry with laboratories and eight credit hours (two semesters or equivalent) of general biology with laboratories
4. Assessment of prior graduate course work and/or relevant laboratory experience (where applicable)
5. Three letters of recommendation pertaining specifically to the student's potential ability as a graduate student in forensic science
6. Personal statement
7. Satisfactory scores on GRE

Applicants are required to select a concentration and will be considered only for that concentration. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those required for the concentration.

Additional admission requirements for concentration in forensic biology

In addition to the M.S. in Forensic Science general admission requirements, applicants to the forensic biology concentration must have completed a minimum of nine credit hours or equivalent of upper-level course work in the biological or biochemical sciences. This may include, but is not limited to, course work in cell biology, general biochemistry, genetics and/or molecular biology.

Degree requirements

The graduate program is a full-time, two-year program. Courses will vary depending on the concentration selected. Required and elective courses are offered at various times, day and night, throughout the week. The M.S. in Forensic Science requires 42 graduate credit hours of course work, including 27 credit hours of required core course work and 15 credit hours of specialized course work designed for each concentration (including electives). The required course work includes a directed research project, which is an extensive research experience conducted within a forensic laboratory setting.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students must complete a minimum of 42 graduate-level credit hours as outlined in the list of core and concentration requirements, including electives.
2. Grade requirements: Students must maintain an ongoing, cumulative minimum GPA of 3.0. Receipt of a grade of C in two or more courses will constitute an automatic dismissal from the graduate program in forensic science. Receipt of a grade of D or lower in any one course will constitute an automatic dismissal from the graduate program in forensic science.
3. Other requirements: Students must maintain continuous, full-time enrollment. Interruption in continuous enrollment or full-time status for any reason without a leave of absence approved by the forensic science graduate committee will require that students reapply to the program. Request for credit for graduate course work taken at other institutions must be submitted to the director of graduate studies in forensic science and will be considered on a case-by-case basis by the forensic science graduate committee. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those listed below. These will not count toward the 42 required credit hours.

Curriculum requirements

Course	Title	Hours
FRSC 570	Forensic Science Seminar [1,2]	3
FRSC 661	Analysis of Pattern Evidence [3]	3
or FRSC 662	Firearm and Toolmark Identification	
FRSC 670	Forensic Evidence and Criminal Procedure	3
FRSC 671	Instrumentation in Forensic Chemistry [2]	3
FRSC 673 & FRSZ 673	Forensic Microscopy and Forensic Microscopy Laboratory [2]	3
FRSC 675 & FRSZ 675	Forensic Serology and DNA Analysis and Forensic Serology and DNA Analysis Laboratory [2]	3
FRSC 677	Professional Practices and Expert Testimony	3
FRSC 793	Directed Research in Forensic Science	3
STAT 543	Statistical Methods I	3
or BIOS 543	Graduate Research Methods I	
Forensic biology concentration courses		
BIOL/HGEN 516	Population Genetics	3
FRSC 565	Scientific Crime Scene Investigation [3]	3
FRSC 676	Advanced Forensic DNA Analysis [3]	3

Recommended electives		
Select six credit hours from the following: [4]		6
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOL 530/ HGEN 501	Introduction to Human Genetics	
BIOL/BNFO 540	Fundamentals of Molecular Genetics	
BIOL 693	Current Topics in Biology (molecular biology)	
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
CHEM 630	Electroanalytical Chemistry	
CHEM 631	Separation Science	
CHEM 632	Chemometrics	
CHEM 633	Mass Spectrometry	
CHEM 634	Surface Science	
CRJS 591	Topic Seminar (drugs and crime)	
FRSC 505	Forensic Entomology	
FRSC 510	Developmental Osteology	
FRSC 515	Advanced Forensic Anthropology	
FRSC 520	Forensic Fire Investigation	
FRSC 566	Advanced Crime Scene Investigation [3]	
FRSC 580	Applied Statistics for Forensic Science	
FRSC 607	Forensic Taphonomy	
FRSC/PHTX 644	Forensic Toxicology [3]	
FRSC 661	Analysis of Pattern Evidence [3]	
FRSC 662	Firearm and Toolmark Identification [3]	
FRSC 663	Forensic Medicine	
FRSC 672	Advanced Drug Analysis [3]	
FRSC/CRJS 680	Forensic Psychiatry	
FRSC 681	Analysis of Fire Debris and Explosives [3]	
FRSC 682	Forensic Analysis of Paint and Polymers [3]	
FRSC 690	Scientific Writing	
FRSC 692	Forensic Science Independent Study	
FRSC 693	Current Topics in Forensic Science	
FRSC 792	Research Techniques	
PHIS 501	Mammalian Physiology	
PHTX 536	Principles of Pharmacology and Toxicology	
PHTX 548	Drug Dependence	
Total Hours		42

1

One-credit hour must be completed each semester during first year

2

Courses required during the first fall semester upon entry in to the program

3

Course consists of lecture and laboratory

4

In consultation with adviser. At least one elective must be a graduate-level molecular biology related course.

Total graduate credit hours required (minimum) 42

Graduate program director
Sarah Williams, Ph.D.
Assistant professor
Email: sseashols@vcu.edu
Phone: (804) 827-8597

Program website: forensicscience.vcu.edu (http://forensicscience.vcu.edu)

Forensic Science, Master of Science (M.S.) with a concentration in forensic chemistry/drugs and toxicology

Program accreditation
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Program goal

The Master of Science in Forensic Science is one of only a few of its kind in the U.S. The mission of the program is to prepare students for careers as forensic scientists in government and private forensic laboratories. In addition, students will be prepared to pursue further graduate and/or professional academic degrees.

Core courses in the forensic science curriculum offer broad exposure to forensic laboratory equipment and instrumentation, as well as legal issues, expert testimony, forensic biology, forensic chemistry, trace evidence, physical evidence, professional ethics, quality assurance and current topics in research and development within the forensic sciences. Students entering the program will be required to select a concentration by the end of the first semester. Concentrations offered include forensic biology, forensic chemistry/drugs and toxicology, forensic chemistry/trace and forensic physical analysis. A strong emphasis is placed on laboratory course work, providing students with significant laboratory and research experience. Several of the laboratory courses are taught by practicing professional forensic scientists at the Virginia Division of Forensic Science Central Laboratory, which is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

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3. Completion of eight credit hours (two semesters or equivalent) of organic chemistry with laboratories and eight credit hours (two semesters or equivalent) of general biology with laboratories
4. Assessment of prior graduate course work and/or relevant laboratory experience (where applicable)
5. Three letters of recommendation pertaining specifically to the student's potential ability as a graduate student in forensic science
6. Personal statement
7. Satisfactory scores on GRE

Applicants are required to select a concentration and will be considered only for that concentration. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those required for the concentration.

Additional admission requirements for concentration in forensic chemistry/drugs and toxicology

In addition to the M.S. in Forensic Science general admission requirements, applicants to the concentration in forensic chemistry/drugs and toxicology must have completed a minimum of nine credit hours or equivalent of upper-level chemistry or biochemistry course work. This may include, but is not limited to, course work in physical chemistry, instrumental analysis, quantitative analysis, pharmacology and/or general biochemistry.

Degree requirements

The graduate program is a full-time, two-year program. Courses will vary depending on the concentration selected. Required and elective courses are offered at various times, day and night, throughout the week. The M.S. in Forensic Science requires 42 graduate credit hours of course work, including 27 credit hours of required core course work and 15 credit hours of specialized course work designed for each concentration (including electives). The required course work includes a directed research project,

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FRSC 677	Professional Practices and Expert Testimony	3
FRSC 793	Directed Research in Forensic Science	3
STAT 543	Statistical Methods I	3
or FRSC 580	Applied Statistics for Forensic Science	
or BIOS 543	Graduate Research Methods I	
Forensic chemistry/drugs and toxicology concentration courses		
FRSC 565	Scientific Crime Scene Investigation [3]	3
or FRSC 663	Forensic Medicine	
FRSC/PHTX 644	Forensic Toxicology	3
FRSC 672	Advanced Drug Analysis [3]	3
Recommended electives		
Select six credit hours of the following: [4]		6
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CHEM 633	Mass Spectrometry	
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FRSC 580	Applied Statistics for Forensic Science	
FRSC 607	Forensic Taphonomy	
FRSC 661	Analysis of Pattern Evidence [3]	
FRSC 662	Firearm and Toolmark Identification [3]	
FRSC 663	Forensic Medicine	
FRSC 676	Advanced Forensic DNA Analysis [3]	
FRSC/CRJS 680	Forensic Psychiatry	
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FRSC 682	Forensic Analysis of Paint and Polymers [3]	
FRSC 690	Scientific Writing	
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One-credit hour must be completed each semester during first year

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Total graduate credit hours required (minimum) 42

Graduate program director
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Program goal

The Master of Science in Forensic Science is one of only a few of its kind in the U.S. The mission of the program is to prepare students for careers as forensic scientists in government and private forensic laboratories. In addition, students will be prepared to pursue further graduate and/or professional academic degrees.

Core courses in the forensic science curriculum offer broad exposure to forensic laboratory equipment and instrumentation, as well as legal issues, expert testimony, forensic biology, forensic chemistry, trace evidence, physical evidence, professional ethics, quality assurance and current topics in research and development within the forensic sciences. Students entering the program will be required to select a concentration by the end of the first semester. Concentrations offered include forensic biology, forensic chemistry/drugs and toxicology, forensic chemistry/trace and forensic physical analysis. A strong emphasis is placed on laboratory course work, providing students with significant laboratory and research experience. Several of the laboratory courses are taught by practicing professional forensic scientists at the Virginia Division of Forensic Science Central Laboratory, which is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

Student learning outcomes

1. Students will be able to apply basic principles and laboratory procedures of biology and chemistry to forensic science through focused study in the available concentration options.
2. Students will demonstrate capabilities, use, potential and limitations of forensic laboratory theory and techniques.
3. Students will demonstrate the ability to perform (report and orally present) independent research in an area of forensic science.
4. Students will demonstrate an understanding of legal procedure, rules of evidence, ethical and professional duties and responsibilities of the forensic scientist.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The forensic science graduate student handbook is available at forensicscience.vcu.edu/graduate/student-handbook (http://forensicscience.vcu.edu/graduate/student-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE

Note: Review of application and offers of admission will begin Jan. 15 and proceed until enrollment openings are filled. All applicants are automatically considered for graduate teaching assistantships in the Department of Forensic Science; however, the earlier a student's application is complete, the better the chance of being selected for an assistantship.

In addition to the general admission requirements of the VCU Graduate School (http://www.pubapps.vcu.edu/Bulletins/prog_search/?uid=10045&iid=30033&did=20062), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in a natural science discipline, including forensic science, or a degree with equivalent course work
2. An undergraduate GPA that exceeds 2.9 on a 4.0 scale (Most students entering the forensic science graduate program have a minimum GPA of 3.0 on undergraduate work and a combined score of 300 or more on the verbal and quantitative sections of the GRE
3. Completion of eight credit hours (two semesters or equivalent) of organic chemistry with laboratories and eight credit hours (two semesters or equivalent) of general biology with laboratories
4. Assessment of prior graduate course work and/or relevant laboratory experience (where applicable)
5. Three letters of recommendation pertaining specifically to the student's potential ability as a graduate student in forensic science
6. Personal statement
7. Satisfactory scores on GRE

Applicants are required to select a concentration and will be considered only for that concentration. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those required for the concentration.

Additional admission requirements for concentration in forensic chemistry/trace

In addition to the M.S. in Forensic Science general admission requirements, applicants to the forensic chemistry/trace concentration must have completed a minimum of nine semester credit hours or equivalent of upper-level chemistry course work. This may include, but is not limited to, course work in physical chemistry, instrumental analysis, quantitative analysis and/or inorganic chemistry.

Degree requirements

The graduate program is a full-time, two-year program. Courses will vary depending on the concentration selected. Required and elective courses are offered at various times, day and night, throughout the week. The M.S. in Forensic Science requires 42 graduate credit hours of course work, including 27 credit hours of required core course work and 15 credit hours of specialized course work designed for each concentration (including electives). The required course work includes a directed research project, which is an extensive research experience conducted within a forensic laboratory setting.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students must complete a minimum of 42 graduate-level credit hours as outlined in the list of core and concentration requirements, including electives.
2. Grade requirements: Students must maintain an ongoing, cumulative minimum GPA of 3.0. Receipt of a grade of C in two or more courses will constitute an automatic dismissal from the graduate program in forensic science. Receipt of a grade of D or lower in any one course will constitute an automatic dismissal from the graduate program in forensic science.
3. Other requirements: Students must maintain continuous, full-time enrollment. Interruption in continuous enrollment or full-time status for any reason without a leave of absence approved by the forensic science graduate committee will require that students reapply to the program. Request for credit for graduate course work taken at other institutions must be submitted to the director of graduate studies in forensic science and will be considered on a case-by-case basis by the forensic science graduate committee. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those listed below. These will not count toward the 42 required credit hours.

Curriculum requirements

Course	Title	Hours
FRSC 570	Forensic Science Seminar [1,2]	3
FRSC 661	Analysis of Pattern Evidence [3]	3
or FRSC 662	Firearm and Toolmark Identification	
FRSC 670	Forensic Evidence and Criminal Procedure	3
FRSC 671	Instrumentation in Forensic Chemistry [2]	3
FRSC 673 & FRSZ 673	Forensic Microscopy and Forensic Microscopy Laboratory [2]	3
FRSC 675 & FRSZ 675	Forensic Serology and DNA Analysis and Forensic Serology and DNA Analysis Laboratory [2]	3
FRSC 677	Professional Practices and Expert Testimony	3
FRSC 793	Directed Research in Forensic Science	3
STAT 543	Statistical Methods I	3
or FRSC 580	Applied Statistics for Forensic Science	
or BIOS 543	Graduate Research Methods I	
Forensic chemistry/trace concentration courses		
FRSC 565	Scientific Crime Scene Investigation [3]	3
FRSC 681	Analysis of Fire Debris and Explosives [3]	3
FRSC 682	Forensic Analysis of Paint and Polymers [3]	3
Recommended electives		
Select six credit hours of the following: [4]		6
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOL 530/ HGEN 501	Introduction to Human Genetics	

BIOL/BNFO 540	Fundamentals of Molecular Genetics
BIOL 693	Current Topics in Biology (molecular biology)
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry
CHEM 630	Electroanalytical Chemistry
CHEM 631	Separation Science
CHEM 632	Chemometrics
CHEM 633	Mass Spectrometry
CHEM 634	Surface Science
CRJS 591	Topic Seminar (drugs and crime)
FRSC 505	Forensic Entomology
FRSC 510	Developmental Osteology
FRSC 515	Advanced Forensic Anthropology
FRSC 520	Forensic Fire Investigation
FRSC 566	Advanced Crime Scene Investigation [3]
FRSC 580	Applied Statistics for Forensic Science
FRSC 607	Forensic Taphonomy
FRSC/PHTX 644	Forensic Toxicology
FRSC 661	Analysis of Pattern Evidence [3]
FRSC 662	Firearm and Toolmark Identification [3]
FRSC 663	Forensic Medicine
FRSC 672	Advanced Drug Analysis [3]
FRSC 676	Advanced Forensic DNA Analysis [3]
FRSC/CRJS 680	Forensic Psychiatry
FRSC 690	Scientific Writing
FRSC 692	Forensic Science Independent Study
FRSC 693	Current Topics in Forensic Science
FRSC 792	Research Techniques
PHIS 501	Mammalian Physiology
PHTX 536	Principles of Pharmacology and Toxicology
PHTX 548	Drug Dependence
Total Hours	42

1

One-credit hour must be completed each semester during first year.

2

Courses required during the first fall semester upon entry in to the program.

3

Course consists of lecture and laboratory.

4

In consultation with adviser. At least one elective must be a graduate-level chemistry course.

Total graduate credit hours required (minimum) 42

Graduate program director

Sarah Williams, Ph.D.
Assistant professor
Email: sseashols@vcu.edu
Phone: (804) 827-8597

Program website: forensicscience.vcu.edu (http://forensicscience.vcu.edu)

Forensic Science, Master of Science (M.S.) with a concentration in forensic physical analysis

Program accreditation
Forensic Science Education Programs Accreditation Commission

Program goal

The Master of Science in Forensic Science is one of only a few of its kind in the U.S. The mission of the program is to prepare students for careers as forensic scientists in government and private forensic laboratories. In addition, students will be prepared to pursue further graduate and/or professional academic degrees.

Core courses in the forensic science curriculum offer broad exposure to forensic laboratory equipment and instrumentation, as well as legal issues, expert testimony, forensic biology, forensic chemistry, trace evidence, physical evidence, professional ethics, quality assurance and current topics in research and development within the forensic sciences. Students entering the program will be required to select a concentration by the end of the first semester. Concentrations offered include forensic biology, forensic chemistry/drugs and toxicology, forensic chemistry/trace and forensic physical analysis. A strong emphasis is placed on laboratory course work, providing students with significant laboratory and research experience. Several of the laboratory courses are taught by practicing professional forensic scientists at the Virginia Division of Forensic Science Central Laboratory, which is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

Student learning outcomes

1. Students will be able to apply basic principles and laboratory procedures of biology and chemistry to forensic science through focused study in the available concentration options.
2. Students will demonstrate capabilities, use, potential and limitations of forensic laboratory theory and techniques.
3. Students will demonstrate the ability to perform (report and orally present) independent research in an area of forensic science.
4. Students will demonstrate an understanding of legal procedure, rules of evidence, ethical and professional duties and responsibilities of the forensic scientist.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The forensic science graduate student handbook is available at forensicscience.vcu.edu/graduate/student-handbook (http://forensicscience.vcu.edu/graduate/student-handbook).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE

Note: Review of application and offers of admission will begin Jan. 15 and proceed until enrollment openings are filled. All applicants are automatically considered for graduate teaching assistantships in the Department of Forensic Science; however, the earlier a student's application is complete, the better the chance of being selected for an assistantship.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in a natural science discipline, including forensic science, or a degree with equivalent course work
2. An undergraduate GPA that exceeds 2.9 on a 4.0 scale (Most students entering the forensic science graduate program have a minimum GPA of 3.0 on undergraduate work and a combined score of 300 or more on the verbal and quantitative sections of the GRE
3. Completion of eight credit hours (two semesters or equivalent) of organic chemistry with laboratories and eight credit hours (two semesters or equivalent) of general biology with laboratories
4. Assessment of prior graduate course work and/or relevant laboratory experience (where applicable)
5. Three letters of recommendation pertaining specifically to the student's potential ability as a graduate student in forensic science
6. Personal statement
7. Satisfactory scores on GRE

Applicants are required to select a concentration and will be considered only for that concentration. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those required for the concentration.

Additional admission requirements for concentration in forensic physical analysis

In addition to the M.S. in Forensic Science general admission requirements, applicants to the forensic physical analysis concentration must have completed a minimum of nine credit hours or equivalent of upper-level science course work. This may include, but is not limited to, course work in the areas of biology, chemistry, physics or biochemistry.

Degree requirements

The graduate program is a full-time, two-year program. Courses will vary depending on the concentration selected. Required and elective courses are offered at various times, day and night, throughout the week. The M.S. in Forensic Science requires 42 graduate credit hours of course work, including 27 credit hours of required core course work and 15 credit hours of specialized course work designed for each concentration (including electives). The required course work includes a directed research project, which is an extensive research experience conducted within a forensic laboratory setting.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students must complete a minimum of 42 graduate-level credit hours as outlined in the list of core and concentration requirements, including electives.
2. Grade requirements: Students must maintain an ongoing, cumulative minimum GPA of 3.0. Receipt of a grade of C in two or more courses will constitute an automatic dismissal from the graduate program in forensic science. Receipt of a grade of D or lower in any one course will constitute an automatic dismissal from the graduate program in forensic science.

3. Other requirements: Students must maintain continuous, full-time enrollment. Interruption in continuous enrollment or full-time status for any reason without a leave of absence approved by the forensic science graduate committee will require that students reapply to the program. Request for credit for graduate course work taken at other institutions must be submitted to the director of graduate studies in forensic science and will be considered on a case-by-case basis by the forensic science graduate committee. If course work deficiencies are identified, students may be required to take additional foundational courses beyond those listed below. These will not count toward the 42 required credit hours.

Curriculum requirements

Course	Title	Hours
FRSC 570	Forensic Science Seminar (three credits minimum) [1,2]	3
FRSC 661	Analysis of Pattern Evidence [3]	3
or FRSC 662	Firearm and Toolmark Identification	
FRSC 670	Forensic Evidence and Criminal Procedure	3
FRSC 671	Instrumentation in Forensic Chemistry [2]	3
FRSC 673 & FRSZ 673	Forensic Microscopy and Forensic Microscopy Laboratory [2]	3
FRSC 675 & FRSZ 675	Forensic Serology and DNA Analysis and Forensic Serology and DNA Analysis Laboratory [2]	3
FRSC 677	Professional Practices and Expert Testimony	3
FRSC 793	Directed Research in Forensic Science	3
STAT 543	Statistical Methods I	3
or FRSC 580	Applied Statistics for Forensic Science	
or BIOS 543	Graduate Research Methods I	
Forensic physical analysis concentration courses		
FRSC 565	Scientific Crime Scene Investigation [3]	3
FRSC 566	Advanced Crime Scene Investigation	3
Elective area options (select one of the following)		9
Pattern evidence		
FRSC 661	Analysis of Pattern Evidence [3]	
or FRSC 662	Firearm and Toolmark Identification	
(Choose the course not taken as part of the core curriculum)		
Choose an additional six credits of electives		
or		
Forensic anthropology and entomology		
Select two from:		
FRSC 505	Forensic Entomology	
FRSC 510	Developmental Osteology	
FRSC 515	Advanced Forensic Anthropology	
FRSC 607	Forensic Taphonomy	
Choose an additional three credits of electives		
Recommended electives		
Select the requisite credit hours for your elective area option from the following: [4]		
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOL 530/ HGEN 501	Introduction to Human Genetics	
BIOL/BNFO 540	Fundamentals of Molecular Genetics	
BIOL 693	Current Topics in Biology (molecular biology)	
CHEM 506	Introduction to Spectroscopic Methods in Organic Chemistry	
CHEM 606	Advanced Spectroscopic Methods in Organic Chemistry	
CHEM 630	Electroanalytical Chemistry	
CHEM 631	Separation Science	
CHEM 632	Chemometrics	
CHEM 633	Mass Spectrometry	
CHEM 634	Surface Science	
CRJS 591	Topic Seminar (drugs and crime)	
FRSC 505	Forensic Entomology	
FRSC 510	Developmental Osteology	
FRSC 515	Advanced Forensic Anthropology	
FRSC 520	Forensic Fire Investigation	
FRSC 580	Applied Statistics for Forensic Science	
FRSC 607	Forensic Taphonomy	
FRSC/PHTX 644	Forensic Toxicology	
FRSC 661	Analysis of Pattern Evidence [3]	
FRSC 662	Firearm and Toolmark Identification [3]	
FRSC 663	Forensic Medicine	
FRSC 676	Advanced Forensic DNA Analysis [3]	
FRSC/CRJS 680	Forensic Psychiatry	
FRSC 681	Analysis of Fire Debris and Explosives [3]	
FRSC 682	Forensic Analysis of Paint and Polymers [3]	
FRSC 690	Scientific Writing	
FRSC 692	Forensic Science Independent Study	
FRSC 693	Current Topics in Forensic Science	
FRSC 792	Research Techniques	
PHIS 501	Mammalian Physiology	
PHTX 536	Principles of Pharmacology and Toxicology	
PHTX 548	Drug Dependence	
Total Hours		42

1

One-credit hour must be completed each semester during first year.

2

Courses required during the first fall semester upon entry in to the program.

3

Course consists of lecture and laboratory.

4

In consultation with adviser

Total graduate credit hours required (minimum) 42

Graduate program director
Sarah Williams, Ph.D.
Assistant professor
Email: sseashols@vcu.edu
Phone: (804) 827-8597

Program website: forensicscience.vcu.edu (http://forensicscience.vcu.edu)

Department of Gender, Sexuality and Women's Studies

Kathleen Ingram, Ph.D.
Associate professor and chair

gsws.vcu.edu (http://gsws.vcu.edu)

Gender, sexuality and women's studies provides a broad interpretation and view of diversity, including the interdisciplinary, cross-cultural examination of women's perspectives and experiences, masculinity and femininity, and heterosexuality and alternate sexualities as culturally constructed and socially experienced.

- Gender, Sexuality and Women's Studies, Certificate in (Post baccalaureate graduate certificate) (p. 274)

Gender, Sexuality and Women's Studies, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The Department of Gender, Sexuality and Women's Studies is devoted to the interdisciplinary, multicultural study of the achievements, contributions, perspectives, experiences, roles and status of women encompassing the intersectionality of race, class, age, ethnicity, disability status, nationality and sexual identity.

Student learning outcomes

1. Have a firm grasp of the feminist paradigm, including feminist theories and the theoretical frameworks that inform the analysis of social, cultural, historical, economic and political forces that shape the experiences of women
2. Demonstrate facility for problem-solving and critical-thinking
3. Demonstrate facility for intersectional analysis as it relates to diversity
4. Be grounded in and understand the linkages between the liberal arts and sciences including commonalities, differences and contributions of each to the field of gender, sexuality and women's studies

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 30	
	Spring	Nov 30	

Special requirements

- Fall semester entrance is required for students without prior course work in gender, sexuality or women's studies (graduate or undergraduate).

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission: Students possessing a B.A. or B.S. degree are eligible for admission into this certificate program.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students in the Certificate in Gender, Sexuality and Women's Studies program are required to earn a minimum of 15 graduate-level credit hours beyond the baccalaureate.
2. Grade requirements: An overall GPA of 3.0 is required for award of the certificate, and no more than three credit hours of C may be earned in the certificate program curriculum.

Curriculum requirements

Course	Title	Hours
Required courses		
GSWS 501	Feminist Theory	3
GSWS 602	Feminist Research Epistemology and Methods	3
GSWS 620	Theorizing Sexuality	3
Recommended electives		
Select two of the following: [1]		6
GSWS 622	Women and Public Policy	
GSWS 624	Gender and Cultural Production	
GSWS 691	Topics in Gender, Sexuality and Women's Studies	
GSWS 692	Independent Study (hours variable)	
HIST (500- and 600-level)		
PSYC (500- and 600-level)		
SOCY (500- and 600-level)		
Total Hours		15

[1] Courses outside departmental GSWS offerings required prior approval.

Total graduate credit hours required (minimum) 15

Graduate program director
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Chair, Department of Gender, Sexuality and Women's Studies
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(804) 828-3893

Program website: gsws.vcu.edu (http://www.gsws.vcu.edu)

Department of History

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Box 842001
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Phone: (804) 828-1635
Fax: (804) 828-7085

history.vcu.edu (http://history.vcu.edu)

John C Powers, Ph.D.
Associate professor and chair

Peter Stone, Ph.D.
Assistant professor and assistant to the chair

Leigh Ann Craig, Ph.D.
Associate professor and director of undergraduate studies

Emilie Raymond, Ph.D.
Professor and director of graduate studies

Kathleen Murphy
Administrative coordinator

The Department of History offers programs at the graduate and undergraduate levels, specializing in a multidimensional analysis of the human past. Faculty research interests vary among thematic, topical, national or chronological emphases. For more information regarding the department and its specialty areas, visit the website at history.vcu.edu (http://history.vcu.edu).

- History, Master of Arts (M.A.) (p. 275)
- Public History, Certificate in (Post-baccalaureate graduate certificate) (p. 277)

History, Master of Arts (M.A.)

Program goals

The master's program in history draws on faculty expertise and the wealth of historical resources available in the Richmond area to support the extended exploration of the human past and the craft of history. It prepares students for the successful practice of historical scholarship in a variety of fields including archives, libraries, historical sites, museums, government agencies, businesses, publishing and secondary education, as well as for advanced study in doctoral programs.

Student learning outcomes

Graduates of the program will:

1. Develop the ability to understand the processes and methodologies historians use to study the past
2. Develop the ability to understand and think critically about scholarly works of history
3. Develop the ability to do historical research and present interpretations in writing
4. Develop the ability to understand the myriad of forces that shape human experiences and critically weigh change and continuity over time

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Jul 1	GRE
	Spring	Dec 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Normally, 30 credit hours of undergraduate history courses, of which 18 credit hours should be at the upper-division level
2. A GPA indicative of the ability to successfully pursue a graduate degree
3. Three letters of recommendation from persons qualified to provide information concerning the applicant's probable success in graduate school
4. Satisfactory completion of the Graduate Record Examination
5. Submission of a written statement of intent, indicating why the applicant wishes to pursue a graduate degree in history

The submission of a writing sample, demonstrating the applicant's writing ability and research skills, is strongly encouraged.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. The Master of Arts in History may be achieved through one of two options:
   a. The thesis option requires 30 graduate credit hours with six credit hours of HIST 698.
   b. The non-thesis option requires 36 graduate credit hours with a minimum of six credits in research-level courses and an oral comprehensive exam.
2. At least half of the credit hours presented for graduation must be at the 600 level or higher.
3. Students may take up to six credits of non-history electives from an approved list of elective courses. In addition, students who wish to pursue specific areas of study may, with the approval of the graduate director, substitute other courses when appropriate, but in no case shall be able to count more than six credit hours of non-history courses.

Curriculum requirements

Thesis option

Course	Title	Hours
Required courses		
HIST 601	Historiography and Methodology	3
HIST 698	M.A. Thesis	6
Electives		
Select seven of the following: [1]		21
HIST 511	Studies in American History	
HIST 515	Studies in European History	
HIST 519	Studies in Ethnic and Social History	
HIST 523	Studies in Virginia and Southern History	
HIST 527	Studies in African-American History	
HIST 591	Special Topics in History	
HIST 611	Readings in American History	
HIST 615	Readings in European History	
HIST 618	Readings in Transatlantic History	
HIST 619	Readings in Ethnic and Social History	

HIST 623	Readings in Virginia and Southern History	
HIST 627	Readings in African-American History	
HIST 631	Research in American History	
HIST 635	Research in European History	
HIST 638	Research in Transatlantic History	
HIST 639	Research in Ethnic and Social History	
HIST 643	Research in Virginia and Southern History	
HIST 647	Research in African-American History	
HIST 651	Public History: Theory and Practice	
HIST 652	Documentary Editing and Scholarly Publishing	
HIST 653	American Material Culture	
HIST 654	Oral History: Theory and Practice	
HIST 691	Special Topics in History	
HIST 692	Independent Study [2]	
or HIST 693	Internship in History	
TEDU 627	Exploring Historical Consciousness	
Total Hours		30

1

With prior approval, a student may take up to six graduate credit hours from outside of the history department.

2

Six credits maximum allowed for independent study or internship.

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Required course		
HIST 601	Historiography and Methodology	3
Electives		
Select two research courses of the following:		6
HIST 631	Research in American History	
HIST 635	Research in European History	
HIST 638	Research in Transatlantic History	
HIST 639	Research in Ethnic and Social History	
HIST 643	Research in Virginia and Southern History	
HIST 647	Research in African-American History	
Select nine of the following: [1]		27
HIST 511	Studies in American History	
HIST 515	Studies in European History	
HIST 519	Studies in Ethnic and Social History	
HIST 523	Studies in Virginia and Southern History	
HIST 527	Studies in African-American History	
HIST 591	Special Topics in History	
HIST 611	Readings in American History	
HIST 615	Readings in European History	
HIST 618	Readings in Transatlantic History	
HIST 619	Readings in Ethnic and Social History	
HIST 623	Readings in Virginia and Southern History	
HIST 627	Readings in African-American History	
HIST 631	Research in American History	
HIST 635	Research in European History	
HIST 638	Research in Transatlantic History	
HIST 639	Research in Ethnic and Social History	
HIST 643	Research in Virginia and Southern History	
HIST 647	Research in African-American History	
HIST 651	Public History: Theory and Practice	
HIST 652	Documentary Editing and Scholarly Publishing	
HIST 653	American Material Culture	
HIST 654	Oral History: Theory and Practice	
HIST 691	Special Topics in History	
HIST 692	Independent Study [2]	
or HIST 693	Internship in History	
TEDU 627	Exploring Historical Consciousness	
Total Hours		36

1

With prior approval, a student may take up to six graduate credit hours from outside of the history department.

2

Six credits maximum allowed for independent study or internship.

Total graduate credit hours required (minimum) 36

Graduate program director
Emilie Raymond, Ph.D.
Professor and director of graduate studies
eeraymond@vcu.edu
(804) 828-1635

Program website: history.vcu.edu (http://history.vcu.edu)

Public History, Certificate in (Post-baccalaureate graduate certificate)

Program goals

The graduate Certificate in Public History draws on faculty expertise and the wealth of historical resources available in the Richmond area to prepare students for professional work in the field of public history. Public history can be defined as the practice of history outside the classroom, exemplified by the work of archivists, museum curators, historical guides, historic preservationists, editors, publishers, administrators and digital media specialists. Accordingly, pursuit of this certificate builds theoretical and methodological knowledge as well as hands-on experience to provide students an entry into the field.

At any time, students in the certificate program may apply for admission into the Master of Arts in History program and, if accepted, may transfer the certificate credits toward partial fulfillment of the master's degree requirements. Conversely, students currently enrolled in the Master of

Arts in History program may fulfill this certificate's requirements as part of their degree.

Student learning outcomes

Graduates of the program will:

- Apply to project development the concept of "shared authority" with which public historians engage their various audiences
- Apply the processes and methodologies historians use to study the past
- Present historical interpretations effectively in different formats
- Work collaboratively in a professional setting

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul1	
	Spring	Dec 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

- Undergraduate exposure to history and humanities courses
- A GPA indicative of the ability to successfully complete a graduate program
- Three letters of recommendation from persons qualified to provide information concerning the applicant's probable success in graduate school
- Submission of a written statement of intent, indicating why the applicant wishes to pursue a graduate certificate in history

Three graduate-level transfer credits will be accepted toward the certificate with the department's approval.

Degree requirements

The certificate consists of 15 credit hours, to include the following:

Curriculum requirements

Course	Title	Hours
Required courses		
HIST 651	Public History: Theory and Practice	3
HIST 693	Internship in History	3
Electives		9
ARTH 621	Historical Preservation and Architectural History [1]	
or URSP 517	Historic Preservation in Planning	
ARTH 681	Museums and Communities [1]	
ARTH 682	The Museum as Educational Institution [1]	
ARTH 683	Museum Collections [1]	
ARTH 684	Curating Museum Exhibitions [1]	
HIST 623	Readings in Virginia and Southern History	
HIST 652	Documentary Editing and Scholarly Publishing	
HIST 653	American Material Culture	
HIST 654	Oral History: Theory and Practice	
HIST 691	Special Topics in History (when topic involves public history)	
HIST 693	Internship in History [2]	
PADM 650	Principles of Nonprofit Management [1]	
URSP 647	Adaptive Reuse of Buildings [1]	
Total Hours		15

[1]No more than six credits may be taken from these non-history (HIST) courses.

[2]An additional three credits may be taken in this required course for a maximum of six credits in HIST 693.

Total graduate credit hours required (minimum) 15

Graduate program director
Emilie E. Raymond, Ph.D.
Professor and director of graduate studies
eeraymond@vcu.edu
(804) 828-1635

Program website: history.vcu.edu (http://history.vcu.edu)

Department of Kinesiology and Health Sciences

Joann Richardson, Ph.D.
Associate professor and chair

khs.vcu.edu (http://khs.vcu.edu)

The Department of Kinesiology and Health Sciences offers programs that prepare students to pursue careers that utilize exercise interventions for both healthy and diseased populations and/or careers designed for students who wish to enter a health care-related field (that does not require licensure, certification or registry status). The department offers one undergraduate degree program; the Bachelor of Science with either the exercise science concentration or the health science concentration.

Along with the undergraduate program, the department also offers a Master of Science in Health and Movement Sciences and Doctor of Philosophy in Rehabilitation and Movement Science.

The M.S. in Health and Movement Sciences program provides advanced course work for students interested in the application of health and movement science principles to exercise science, teaching and sports medicine. This program has a central focus on the sciences and is flexible enough so that students, with the assistance of an adviser, can design a program that truly meets their professional goals.

The Doctor of Philosophy in Rehabilitation and Movement Science program is interdisciplinary in nature and includes faculty from the departments of Kinesiology and Health Sciences, Physical Therapy, and Physical Medicine and Rehabilitation. Students choose a concentration in either exercise physiology or neuromusculoskeletal dynamics.

The department also offers a post-baccalaureate undergraduate Certificate in Health Sciences that is designed for students who hold a baccalaureate degree in a non-science area and wish to pursue their undergraduate pre-health sciences requirements at VCU.

For more information, consult the department's website at khs.vcu.edu (http://khs.vcu.edu).

- Health and Movement Sciences, Master of Science (M.S.) with a concentration in exercise science (p. 279)
- Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in exercise physiology (p. 281)
- Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in neuromusculoskeletal dynamics
- Health Behavior Coaching, Certificate in (Post-baccalaureate graduate certificate) (p. 285)

Health and Movement Sciences, Master of Science (M.S.) with a concentration in exercise science

Program goal

This program provides advanced course work for students interested in the application of health and movement science principles to exercise science, teaching and sports medicine. Applicants planning to enter the teaching profession should hold a valid teaching endorsement. Students admitted to this program typically have backgrounds in exercise science, life science or related fields. This program does not provide opportunities for initial licensure in health and physical education.

Student learning outcomes

1. Demonstrate an understanding of research design and statistical applications relative to the disciplines comprising the health and movement sciences
2. Demonstrate mastery of essential knowledge in health and movement science
3. Demonstrate a comprehensive or advanced knowledge of the field of health and movement science

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	GRE-General MAT
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a bachelor's degree in exercise science or a related field from an accredited university or college.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the M.S. in Health and Movement Sciences program are required to earn a minimum of 36 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Master's-level candidacy and requirements: The Master of Science in Health and Movement Sciences program offers a thesis and non-thesis option. After completing at least 12 graduate credit hours and not more than 18 credit hours, with a minimum GPA of 3.0, all students must apply for advancement to candidacy. In the thesis option, students must complete HEMS 798 Thesis for six credit hours and 30 hours of prescribed course work. Students enrolling in this option will not be required to complete a comprehensive examination. In the non-thesis option, students must complete 36 hours of prescribed course work and must pass a comprehensive examination, which is taken after completing 30 hours of course work.

Curriculum requirements

Thesis option

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	3
HEMS 601	Movement Physiology	3
HEMS 604	Nutrition for Health and Physical Activity	3
HEMS 605	Psychology of Physical Activity	3
HEMS 610	Laboratory Techniques in Rehabilitation Science	3
HEMS 675	Clinical Exercise Physiology	3
HEMS 798	Thesis	6
General electives from list below		6
Specified elective from list below		3
Total Hours		36

Total graduate credit hours required (minimum) 36

Non-thesis option

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	3
HEMS 601	Movement Physiology	3
HEMS 604	Nutrition for Health and Physical Activity	3
HEMS 605	Psychology of Physical Activity	3
HEMS 610	Laboratory Techniques in Rehabilitation Science	3
HEMS 675	Clinical Exercise Physiology	3
HEMS 692	Independent Study	6
or HEMS 797	Directed Research Study	
or HEMS 695	Externship	
General electives from list below		6
Specified elective from list below		3
Total Hours		36

Total graduate credit hours required (minimum) 36

Specified electives

Course	Title	Hours
HEMS 550	Exercise, Nutrition and Weight Management	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

General electives

Course	Title	Hours
HEMS 550	Exercise, Nutrition and Weight Management	3
HEMS 692	Independent Study	3
HEMS 695	Externship	3

HEMS 797	Directed Research Study	3
REMS 611	Biomechanics of Human Motion	3
REMS 660	Neuromuscular Performance	3
REMS 690	Research Seminar in Rehabilitation and Movement Science	0.5
REMS 701	Advanced Exercise Physiology I	3
REMS 702	Advanced Exercise Physiology II	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

Graduate program director
Ronald K. Evans, Ph.D.
Associate professor and director of graduate studies, Department of Kinesiology and Health Sciences
rkevans@vcu.edu
(804) 828-1948

Program website: khs.vcu.edu (http://www.khs.vcu.edu)

Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in exercise physiology [College of Humanities and Sciences]

Program goal

The Ph.D. in Rehabilitation and Movement Science is an interdisciplinary degree program developed through a collaborative partnership of the departments of Kinesiology and Health Sciences, Physical Therapy, and Physical Medicine and Rehabilitation. The mission of this collaborative degree program is to prepare applied scientists capable of approaching multifaceted health care, preventive medicine and rehabilitation initiatives from an integrative perspective and to prepare graduates to assume research, teaching and leadership positions within rehabilitation and movement science professions.

There are two program concentrations: exercise physiology and neuromusculoskeletal dynamics. The exercise physiology concentration prepares individuals to conduct research, direct external funding initiatives and teach in the area of exercise physiology, with particular focus on physical activity's impact on chronic disease states. The neuromusculoskeletal dynamics concentration prepares individuals for research, teaching and clinical initiatives associated with the identification and rehabilitation of movement disorders.

Student learning outcomes

At the completion of the program students will:

1. Demonstrate comprehensive foundational knowledge within his/her area of program specialization
2. Develop testable hypotheses and appropriate study designs to address relevant research questions in his/her area of program specialization
3. Develop the skills and abilities to collect and manage research data while ensuring ethical and responsible conduct of research
4. Develop the ability to analyze research data and subsequently interpret and synthesize results and draw appropriate conclusions
5. Demonstrate teaching effectiveness in the classroom and/or clinical environment
6. Disseminate research findings effectively in oral and/or written formats

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan. 9 will be given priority consideration. Applications received following the deadline may be considered if space and resources are available.	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have completed at least one of a master's degree in a related area, 30 hours of post-baccalaureate work (e.g. course work at 500 level or greater) or a first-professional degree program
2. Provide official GRE score
3. Submit a curriculum vitae or professional resume indicating an applicant's educational and career experience as well as evidence of research potential

Admission decisions are made only on the basis of a completed application packet.

Applicants being considered for admission must complete an interview with a Ph.D. admissions committee representative and/or research faculty member with whom the student would like to work.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students pursuing the Ph.D. in Rehabilitation and Movement Science must successfully complete:

1. A minimum of 50 credit hours developed in conjunction with their advisers
2. Written and oral comprehensive examinations
3. All other university requirements of qualification for degree candidacy
4. Written dissertation based on a focused line of research
5. Oral defense of the dissertation

Curriculum requirements

Course	Title	Hours
Research core courses		
STAT 543	Statistical Methods I	3
or BIOS 543	Graduate Research Methods I	
STAT 544	Statistical Methods II	3
or BIOS 544	Graduate Research Methods II	
Select one of the following:		3
ALHP 761	Health Related Sciences Research Design	
EDUS 710	Quantitative Research Design	
HADM 761	Health Services Research Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	
PSYC 636	Research Methods in Developmental Psychology	
Select one additional research design class of above or of the following:		3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	
BIOS 531	Clinical Epidemiology	
BIOS 553	Biostatistical Methods I	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
SBHD 610	Behavioral Measurement	
Core concentration		
PHIS 501	Mammalian Physiology	5
REMS 701	Advanced Exercise Physiology I	3
Select one of the following:		3
REMS 703	Cardiovascular Exercise Physiology	
REMS 704	Psychobiology of Physical Activity	
REMS 705	Metabolic Aspects of Physical Activity	
Approved electives (from list below)		7
Labratory rotations		
REMS 710	Research Techniques in Rehabilitation and Movement Science	3
Professional development course work		
REMS 690	Research Seminar in Rehabilitation and Movement Science (.5 credit-hour course repeated for a total of 3 credits)	3
REMS 793	Teaching Practicum in Higher Education	1
REMS 794	Research Presentation Seminar	1
Dissertation research		
REMS 798	Research in Rehabilitation and Movement Science	12
Total Hours		50

Approved electives

Course	Title	Hours
BIOL 524	Endocrinology	3
HEMS 610	Laboratory Techniques in Rehabilitation Science	3
HEMS 675	Clinical Exercise Physiology	3
PHTX 614	Foundation in Psychoneuroimmunology	3
REMS/HEMS 660	Neuromuscular Performance	3
REMS 692	Independent Study	1-3
REMS 702	Advanced Exercise Physiology II	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

Total graduate credit hours required (minimum) 50

Graduate program director

Ronald K. Evans, Ph.D.

Associate professor and director of graduate studies, Department of Kinesiology and Health Sciences
rkevans@vcu.edu
(804) 828-1948

Additional contact
Sheryl D.G. Finucane, Ph.D., P.T.
Assistant professor and graduate program director, Department of Physical Therapy
sfinucan@vcu.edu
(804) 828-0234

Program website: sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science (http://sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science)

Rehabilitation and Movement Science, Doctor of Philosophy (Ph.D.) with a concentration in neuromusculoskeletal dynamics [College of Humanities and Sciences]

Program goal

The Ph.D. in Rehabilitation and Movement Science is an interdisciplinary degree program developed through a collaborative partnership of the departments of Kinesiology and Health Sciences, Physical Therapy, and Physical Medicine and Rehabilitation. The mission of this collaborative degree program is to prepare applied scientists capable of approaching multifaceted health care, preventive medicine and rehabilitation initiatives from an integrative perspective and to prepare graduates to assume research, teaching and leadership positions within rehabilitation and movement science professions.

There are two program concentrations: exercise physiology and neuromusculoskeletal dynamics. The exercise physiology concentration prepares individuals to conduct research, direct external funding initiatives and teach in the area of exercise physiology, with particular focus on physical activity's impact on chronic disease states. The neuromusculoskeletal dynamics concentration prepares individuals for research, teaching and clinical initiatives associated with the identification and rehabilitation of movement disorders.

Student learning outcomes

At the completion of the program students will:

1. Demonstrate comprehensive foundational knowledge within his/her area of program
specialization
2. Develop testable hypotheses and appropriate study designs to address relevant research
questions in his/her area of program specialization
3. Develop the skills and abilities to collect and manage research data while ensuring ethical
and responsible conduct of research
4. Develop the ability to analyze research data and subsequently interpret and synthesize
results and draw appropriate conclusions
5. Demonstrate teaching effectiveness in the classroom and/or clinical environment
6. Disseminate research findings effectively in oral and/or written formats

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan. 9 will be given priority consideration. Applications received following the deadline may be considered if space and resources are available.	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have completed at least one of a master's degree in a related area, 30 hours of post-baccalaureate work (e.g. course work at 500 level or greater) or a first-professional degree program
2. Provide official GRE score
3. Submit a curriculum vitae or professional resume indicating an applicant's educational and career experience as well as evidence of research potential

Admission decisions are made only on the basis of a completed application packet.

Applicants being considered for admission must complete an interview with a Ph.D. admissions committee representative and/or research faculty member with whom the student would like to work.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students pursuing the Ph.D. in Rehabilitation and Movement Science must successfully complete:

1. A minimum of 50 credit hours developed in conjunction with their advisers
2. Written and oral comprehensive examinations
3. All other university requirements of qualification for degree candidacy
4. Written dissertation based on a focused line of research
5. Oral defense of the dissertation

Curriculum requirements

Course	Title	Hours
Research core courses		
STAT 543	Statistical Methods I	3
or BIOS 543	Graduate Research Methods I	
STAT 544	Statistical Methods II	3
or BIOS 544	Graduate Research Methods II	
Select one of the following:		3
ALHP 761	Health Related Sciences Research Design	
EDUS 710	Quantitative Research Design	
HADM 761	Health Services Research Methods I	
HEMS 600	Introduction to Research Design in Health and Movement Sciences	
PSYC 636	Research Methods in Developmental Psychology	
Select one additional research design class of above or of the following:		3
ALHP 716	Grant Writing and Project Management in Health Related Sciences	
BIOS 531	Clinical Epidemiology	
BIOS 553	Biostatistical Methods I	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
SBHD 610	Behavioral Measurement	
Core concentration		
REMS/HEMS 611	Biomechanics of Human Motion	3
REMS/HEMS 660	Neuromuscular Performance	3
REMS 665	Instrumentation in Motion Analysis	3
Approved electives (from list below)		9
Labratory rotations		
REMS 710	Research Techniques in Rehabilitation and Movement Science	3
Professional development course work		
REMS 690	Research Seminar in Rehabilitation and Movement Science (.5 credit-hour course repeated for a total of 3 credits)	3
REMS 793	Teaching Practicum in Higher Education	1
REMS 794	Research Presentation Seminar	1
Dissertation research		
REMS 798	Research in Rehabilitation and Movement Science	12
Total Hours		50

Approved electives

Course	Title	Hours
EPID 622	Maternal and Child Health	3
HEMS 601	Movement Physiology	3
PSYC 603	Developmental Processes	3
PSYC 614	Development in Infancy and Early Childhood	3
REMS/PHTY 608	Advanced Musculoskeletal Sciences	3
REMS/PHTY 612	Advanced Biomechanics	3
REMS 692	Independent Study	1-3
REMS 701	Advanced Exercise Physiology I	3
REMS 702	Advanced Exercise Physiology II	3
REMS 703	Cardiovascular Exercise Physiology	3
REMS 704	Psychobiology of Physical Activity	3
REMS 705	Metabolic Aspects of Physical Activity	3

Total graduate credit hours required (minimum) 50

Graduate program director

Sheryl D.G. Finucane, Ph.D., P.T.

Assistant professor and graduate program director, Department of Physical Therapy

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Additional contact
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Associate professor and director of graduate studies, Department of Kinesiology and Health Sciences
rkevans@vcu.edu
(804) 828-1948

Program website: sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science (http://sahp.vcu.edu/departments/pt/prospective-students/phd-programs/rehabilitation-and-movement-science)

Health Behavior Coaching, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The Post-baccalaureate Graduate Certificate in Health Behavior Coaching prepares professionals to serve a critical role on the interdisciplinary health care delivery team, particularly in the emerging preventive health care model in the U.S. This emerging model is prompted in large part by increased health promotion and chronic disease prevention/management efforts emphasizing improving access to preventive services, improving health outcomes, developing and training preventive care health professionals, reducing health disparities, and helping to control health care spending.

Health behavior coaches support, motivate and empower clients/patients to adopt healthy lifestyles, lower health risks by changing negative behaviors, better self-manage their health, and prevent or control acute and chronic health conditions. In addition, health behavior coaches teach clients/patients how to navigate the complex health care system in order to meet their diverse health care needs. This program will prepare students for an innovative, cutting-edge, STEM-H profession that has emerged in response to the need for more time- and labor-intensive encounters to empower clients/patients to be active and responsible participants in their health outcomes.

The certificate program is designed for professionals from diverse backgrounds ranging from clinical professionals (e.g., physicians, physician assistants, nurses, nurse practitioners, physical therapists, occupational therapists, exercise physiologists, sports medicine practitioners, pharmacists, counselors, psychotherapists, etc.) to health promotion professionals (e.g., health educators, registered dieticians, personal trainers, fitness trainers, athletic trainers, diabetes educators, recreational therapists, etc.). The goal of the program is to develop and enhance professional competencies and skills that facilitate a client/patient-centered and a client/patient-driven approach whereby clients/patients determine their own personal health goals and action plans to achieve those goals versus the traditional practitioner/professional-centered approach. In addition, through the coach's utilization of active learning and self-discovery strategies, client/patient accountability is fostered. The program trains professionals in evidence-based motivational techniques, behavior-change theory and processes, knowledge in healthy lifestyle practices, and communication strategies that assist clients/patients in developing inner resources and intrinsic motivation for adopting and sustaining lifestyle changes to improve health and overall well-being. Successful completion of the program requires a minimum of 21 graduate credit hours beyond the baccalaureate level. The course work consists of 17 core credit hours plus four credit hours in a selected focus area.

The program is committed to providing didactic and experiential learning opportunities that prepare students for credentialing as a certified health education specialist, as administered by the National Commission for Health Education Credentialing Inc.

Student learning outcomes

1. Students will demonstrate a comprehensive understanding of the roles, responsibilities and scope of practice of health behavior coaches in the context of the U.S. health care delivery system.
2. Students will commit to practicing in accordance with applicable laws and regulations.
3. Students will demonstrate skills and competencies in partnering with clients/patients to develop client-centered and client-driven health outcomes goals and a feasible plan to accomplish their goals.
4. Students will demonstrate skills and competencies in facilitating client/patient lifestyle changes and empowering them to sustain healthy behaviors to improve health status, health outcomes and overall well-being.
5. Students will demonstrate their commitment to engage in continuing education to become more proficient in their practice and to ensure that their practice-related knowledge and skills remain current.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Mar 15	

In addition, admission to the program requires that students:

- Have earned an undergraduate degree in a health science, social science, behavioral science or other health-related discipline from an accredited college or university
- Possess a minimum of one year of health-related work experience
- Have completed a minimum of four total prerequisite course credits in medical terminology and personal health

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work and to meet grade requirements.

1. Credit hour requirements: Students in the post-baccalaureate graduate certificate program in health behavior coaching are required to earn a minimum of 21 graduate credit hours beyond the baccalaureate level. The course work consists of 17 core credit hours plus four credit hours in a selected focus area.
2. Grade requirements: Receiving a C or below in two courses constitutes an automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Required courses		
HEMS 640	Health Care Organization and Delivery in the U.S.	3
HEMS 641	Human Disease Prevention, Prevalence and Lifestyle Risk Factors	3
HEMS 642	Theoretical Foundations of Health Behavior Change	3
HEMS 643	Fundamentals of Motivational Interviewing	1
HEMS 644	Advanced Motivational Interviewing	1
HEMS 647	Concepts and Applications in Chronic Disease Self-management	3
HEMS 695	Externship	3
Specified elective courses		
Select one pair of courses based on focus area.		4
HEMS 645 & HEMS 648	Application of Motivational Interviewing in Clinical Settings and Health Behavior Change Counseling Techniques for Clinical Interventions (clinical focus)	
HEMS 646 & HEMS 649	Application of Motivational Interviewing in Group and Community Settings and Planning, Implementing and Evaluating Group/Community Health Behavior Change Interventions (group/community focus)	
Total Hours		21

Graduate program director
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Program website: khs.vcu.edu (http://www.khs.vcu.edu)

Department of Mathematics and Applied Mathematics

Glenn Hurlbert, Ph.D.
Professor and chair

math.vcu.edu (http://www.math.vcu.edu)

The Department of Mathematics and Applied Mathematics offers an undergraduate program leading to a Bachelor of Science in Mathematical Sciences with concentrations in applied mathematics, biomathematics, mathematics and secondary mathematics teacher preparation. The department administers the Master of Science in Mathematical Sciences concentrations in applied mathematics or mathematics and is involved in administering the Doctor of Philosophy in Systems Modeling and Analysis. The curricula of these programs are run jointly with additional concentrations offered by the Department of Statistical Sciences and Operations Research.

- Mathematical Sciences, Master of Science (M.S.) with a concentration in applied mathematics (p. 286)
- Mathematical Sciences, Master of Science (M.S.) with a concentration in mathematics (p. 288)
- Systems Modeling and Analysis, Doctor of Philosophy (Ph.D.) (p. 290)

Mathematical Sciences, Master of Science (M.S.) with a concentration in applied mathematics

Program goal

The Department of Mathematics and Applied Mathematics and the Department of Statistical Sciences and Operations Research jointly offer the M.S. in Mathematical Sciences.

The mission of the Department of Mathematics and Applied Mathematics is to foster excellence in mathematical research and to offer a strong undergraduate and graduate education that will prepare students for stimulating and rewarding employment, career and lifelong learning opportunities. In addition, the department strives to help all VCU students achieve a level of quantitative literacy and analytical skills enabling them to deal effectively with the quantitative issues that they will encounter throughout their lives.

The program offers maximum flexibility by allowing students, in consultation with their graduate committees, to design a course of study that will best develop competence in those areas most relevant to their scholarly and professional objectives. Students may obtain a designation on their transcripts indicating that their graduate study has emphasized the applied mathematics concentration by completing the requirements that are listed here. A student who has not satisfied the requirements for one of the program concentrations offered, but who has otherwise fulfilled all the requirements for a master's degree, will be awarded a degree of Master of Science in Mathematical Sciences without any specialization.

Student learning outcomes

1. Students will develop creative-thinking skills to apply to mathematical problems and proofs.
2. Students will be able to analyze mathematical arguments and write their own arguments and proofs.
3. Students will be able to read and interpret mathematical literature, including technical articles, within their chosen mathematical subfield.
4. Students will be able to use technology, including specialized computational and graphics software, to test the validity of certain conjectures, to solve problems, to conduct mathematical experiments and do mathematical research.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE – general
	Spring	Oct 1	TOEFL (international students only)

Special requirements

- Students should follow priority deadlines for funding consideration.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Thirty credit hours in undergraduate mathematical sciences, computer science or related areas of which at least 18 credit hours must represent upper-level courses
2. Three letters of recommendation pertaining to the student's potential ability as a graduate student in mathematical sciences

Provisional admission may be granted when deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are remedial or designed to remove deficiencies will not be accepted for credit hours toward the fulfillment of the course requirements for the master's degree.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to meet the following requirements.

1. Credit hour requirements: Students in the M.S. in Mathematical Sciences program are required to earn a minimum of 30 graduate-level credit hours. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Students must pass a comprehensive exam in the core courses and selected elective courses determined by the Department of Mathematics and Applied Mathematics.

Curriculum requirements

Thesis option

Course	Title	Hours
Concentration core courses		
MATH 507	Bridge to Modern Analysis	3
MATH 515	Numerical Analysis	3
MATH 535	Introduction to Dynamical Systems	3
Additional courses		
MATH 690	Research Seminar	2
MATH 697	Directed Research [1]	0-3
MATH 698	Thesis (three or six hours) [1,2]	3 or 6
Mathematics electives (Choose courses from list one below.) [2]		6 or 9
Mathematical sciences or allied field electives (Choose courses from list two below.)		7

[1] A maximum total of six credit hours for MATH 697 and MATH 698 may count toward the degree.

[2] A minimum of 12 credits from mathematics electives (list one) and thesis are required for the degree.

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Concentration core courses		
MATH 507	Bridge to Modern Analysis	3
MATH 515	Numerical Analysis	3
MATH 535	Introduction to Dynamical Systems	3
Additional courses		
MATH 690	Research Seminar	2
MATH 697	Directed Research [1]	0-3
Mathematics electives (Choose courses from list one below)		12
Mathematical sciences or allied field electives (Choose courses from list two below)		7

[1] A maximum of three credit hours for MATH 697 may count toward the degree.

Total graduate credit hours required (minimum) 30

List one: Approved mathematics electives

Course	Title	Hours
500-, 600- or 700- level MATH courses except the following:		
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	

List two: Approved electives in mathematical sciences or allied field

Course	Title	Hours
500-, 600- or 700-level MATH, OPER, STAT or SYSM courses except the following:		
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	
STAT/SOCY 508	Introduction to Social Statistics	
STAT 543	Statistical Methods I	
STAT/SOCY 608	Statistics for Social Research	
SYSM 681	Systems Seminar I	
SYSM 682	Systems Seminar II	
SYSM 683	Systems Seminar III	

Graduate program director
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Phone: (804) 828-6820

Program website: math.vcu.edu (http://www.math.vcu.edu)

Program email: mathgrad@vcu.edu

Mathematical Sciences, Master of Science (M.S.) with a concentration in mathematics

Program goal

The Department of Mathematics and Applied Mathematics and the Department of Statistical Sciences and Operations Research jointly offer the M.S. in Mathematical Sciences.

The mission of the Department of Mathematics and Applied Mathematics is to foster excellence in mathematical research and to offer a strong

undergraduate and graduate education that will prepare students for stimulating and rewarding employment, career and lifelong learning opportunities. In addition, the department strives to help all VCU students achieve a level of quantitative literacy and analytical skills enabling them to deal effectively with the quantitative issues that they will encounter throughout their lives.

The program offers maximum flexibility by allowing students, in consultation with their graduate committees, to design a course of study that will best develop competence in those areas most relevant to their scholarly and professional objectives. Students may obtain a designation on their transcripts indicating that their graduate study has emphasized the applied mathematics concentration by completing the requirements that are listed here. A student who has not satisfied the requirements for one of the program concentrations offered, but who has otherwise fulfilled all the requirements for a master's degree, will be awarded a degree of Master of Science in Mathematical Sciences without any specialization.

Student learning outcomes

1. Students will develop creative-thinking skills to apply to mathematical problems and proofs.
2. Students will be able to analyze mathematical arguments and write their own arguments and proofs.
3. Students will be able to read and interpret mathematical literature, including technical articles, within their chosen mathematical subfield.
4. Students will be able to use technology, including specialized computational and graphics software, to test the validity of certain conjectures, to solve problems, to conduct mathematical experiments and do mathematical research.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE – general
	Spring	Oct 1	TOEFL (international students only)

Special requirements

- Students should follow priority deadlines for funding consideration.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Thirty credit hours in undergraduate mathematical sciences, computer science or related areas of which at least 18 credit hours must represent upper-level courses
2. Three letters of recommendation pertaining to the student's potential ability as a graduate student in mathematical sciences

Provisional admission may be granted when deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are remedial or designed to remove deficiencies will not be accepted for credit hours toward the fulfillment of the course requirements for the master's degree.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to meet the following requirements.

1. Credit hour requirements: Students in the M.S. in Mathematical Sciences program are required to earn a minimum of 30 graduate-level credit hours. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Students must pass a comprehensive exam in the core courses and selected elective courses determined by the Department of Mathematics and Applied Mathematics.

Curriculum requirements

Thesis option

Course	Title	Hours
Concentration core courses		
MATH 502	Abstract Algebra I	3
or MATH 610	Advanced Linear Algebra	
MATH 507	Bridge to Modern Analysis	3
MATH 556	Graph Theory	3
Additional courses		
MATH 690	Research Seminar	2
MATH 697	Directed Research [1]	0-3
MATH 698	Thesis (three or six hours) [1,2]	3 or 6
Mathematics electives (Choose courses from list one below) [2]		6 or 9
Mathematical sciences or allied field electives (Choose courses from list two below)		7

1

A maximum total of six credit hours for MATH 697 and MATH 698 may count toward the degree.

2

A minimum of 12 credits from mathematics electives (list one) and thesis are required for the degree.

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Concentration core courses		
MATH 502	Abstract Algebra I	3
or MATH 610	Advanced Linear Algebra	
MATH 507	Bridge to Modern Analysis	3
MATH 556	Graph Theory	3
Additional courses		
MATH 690	Research Seminar [1]	2
MATH 697	Directed Research [1]	0-3
Mathematics electives (Choose courses from list one below)		12
Mathematical sciences or allied field electives (Choose courses from list two below)		7

1

A maximum of three credit hours of MATH 697 may count toward the degree.

Total graduate credit hours required (minimum) 30

List one: Recommended electives in mathematical sciences

Course	Title	Hours
Any 500-, 600- or 700-level MATH courses except the following:		
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	

List two: Recommended electives in mathematical sciences or allied field

Course	Title	Hours
Any 500-, 600- or 700-level MATH, OPER, STAT or SYSM courses except the following:		
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	
STAT/SOCY 508	Introduction to Social Statistics	
STAT 543	Statistical Methods I	
STAT/SOCY 608	Statistics for Social Research	
SYSM 681	Systems Seminar I	
SYSM 682	Systems Seminar II	
SYSM 683	Systems Seminar III	

Graduate program director
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Additional contact
J. Alex McWhorter
Administrative assistant
Email: mcwhorterja@vcu.edu
Phone: (804) 828-6820

Program website: math.vcu.edu (http://www.math.vcu.edu)

Program email: mathgrad@vcu.edu

Systems Modeling and Analysis, Doctor of Philosophy (Ph.D.) [Department of Mathematics and Applied Mathematics]

Program goal

The Ph.D. in Systems Modeling and Analysis is offered jointly by the Department of Statistical Sciences and Operations Research and the Department of Mathematics and Applied Mathematics. The program focuses on the development of the mathematical and computational skills used to conceptualize and analyze real-world

systems. Faculty and students will engage and collaborate to contribute to the knowledge base used in the fields of science, medicine, business and engineering. The continued development of applied mathematics, discrete mathematics, operations research and statistics is critical to scientific advancement in the 21st century. The curriculum enables students to expand the frontiers of knowledge through original, relevant research involving quantitative and qualitative complex systems derived from real, contemporary problems facing our world.

Student learning outcomes

1. Gain a solid foundation in the theory and application of optimization, stochastic processes, simulation, decision analysis and biomathematics, and demonstrate a comprehensive understanding of these concepts
2. Learn to perform appropriate collection, modeling and analysis of data using statistical methods
3. Demonstrate the ability to identify situations in which mathematics, operations research or statistics can be applied and model the situation
4. Demonstrate the ability to solve a wide variety of mathematics, operations research or statistics problems using the software commonly used in industry
5. Demonstrate the ability to write code using appropriate research programming environments to implement research ideas
6. Learn how to interpret the analysis from mathematics, operations research or statistics models to draw meaningful conclusions about the systems being studied
7. Gain the ability to successfully communicate research ideas through writing and presentations
8. Gain the skills needed to successfully participate in research under the guidance of faculty

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Feb 1	GRE-General
	Spring	Nov 1	
	Summer	Jul 1	

Note: Assistantships are only available starting in the fall semester. Spring and summer semester admission deadlines are only for students not seeking an assistantship.

In addition to general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission: have completed an undergraduate degree with at least 30 credit hours of undergraduate-level mathematics, including calculus I and II, multivariate calculus, linear algebra, probability and statistics. Applicants also must have completed at least one upper-level mathematics class that includes mathematical reasoning, such as abstract algebra, combinatorics, graph theory, real analysis or topology.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the systems modeling and analysis Ph.D. program are required to earn a minimum of 57 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Qualifying exam: Students must pass a qualifying exam covering material from each of the first three core courses they take after admission to the program. Two attempts are allowed for each exam. This requirement must be fulfilled by the end of the semester following completion of 18 graduate credit hours. Students

are exempt from a qualifying exam if they earned an A in the corresponding core course or if they took an equivalent course at another university, as determined by the Ph.D. steering committee.

3. Doctoral candidacy: Admission to candidacy is made by evaluation of a qualifying portfolio, including exams and project work from courses; writing samples from the research seminars (SYSM 681, SYSM 682 and SYSM 683); research products from systems research projects (SYSM 697); and statements from faculty advisers and instructors. The portfolio can be submitted after all course work has been completed, as well as any additional preparatory course work required at admission. The candidacy committee will evaluate the student's readiness to begin their dissertation work. Supplementary examination may be required by the committee.
4. Dissertation proposal: After admission to candidacy and the completion of all course work, the student will prepare a written and oral proposal of the intended dissertation research area, including a complete literature review. A successful proposal must be completed at least nine months prior to the dissertation defense.
5. Dissertation defense: The student must complete 18 credit hours in SYSM 798 resulting in a publishable dissertation and a successful oral defense. The student also must have submitted at least one paper to a refereed academic journal and prepared a second manuscript or given a conference presentation on the research prior to the defense.

Curriculum requirements

Course	Title	Hours
Choose three from the following foundation courses:		9
MATH 535	Introduction to Dynamical Systems	
MATH 556	Graph Theory	
OPER 527	Optimization I	
STAT 513	Mathematical Statistics I	
SYSM 681	Systems Seminar I	1
SYSM 682	Systems Seminar II	1
SYSM 683	Systems Seminar III	1
SYSM 697	Systems Research [1]	3
SYSM 798	Dissertation Research	18
Electives (Choose courses from lists below.) [2]		24
Total Hours		57

[1] Students are required to take SYSM 697 with a faculty adviser before admission to candidacy.

[2] Students must complete at least nine credit hours at the 700-level and must complete courses in at least two of the following subject areas: discrete mathematics, mathematical biology, operations research and statistics from the lists below. Electives will be determined based on a student's research interests and in consultation with their advisers and the graduate program director.

Total graduate credit hours required (minimum) 57

Elective courses in discrete mathematics

Course	Title	Hours
MATH 750	Topics in Combinatorics: ____	3
MATH 756	Topics in Graph Theory: ____	3

Elective courses in mathematical biology

Course	Title	Hours
MATH 715	Numerical Solutions for Differential Equations	3
MATH 732	Ordinary Differential Equations II	3
MATH 769	Topics in Applied Mathematics: ____	3
SYSM 780	Stochastic Methods in Mathematical Biology	3

Elective courses in operations research

Course	Title	Hours
OPER 731	Discrete Optimization	3
OPER 732	Optimization Under Uncertainty	3
OPER/STAT 736	Mathematics of Knowledge and Search Engines	3
OPER 741	Advanced Stochastic Simulation	3
OPER 743	Decision Analysis II	3
OPER 791	Special Topics in Operations Research	1-3

Elective courses in statistics

Course	Title	Hours
STAT 725	Advanced Multivariate Statistical Methods	3
STAT/OPER 736	Mathematics of Knowledge and Search Engines	3
STAT 742	Design and Analysis of Experiments II	3
STAT 744	Regression II	3
STAT 745	Advanced Bayesian Statistics	3
STAT 746	Spatial Data Analysis	3
STAT 791	Special Topics in Statistics	1-3
SYSM 780	Stochastic Methods in Mathematical Biology	3

Other electives

Course	Title	Hours
Select 500-, 600- or 700-level MATH, OPER, STAT or SYSM courses except the following:		
MATH 505	Modern Geometry	3
MATH 593	Internship in Mathematical Sciences	3,6
MATH 661	Number and Operations	3
MATH 662	Geometry and Measurement	3
MATH 663	Functions and Algebra	3
MATH 664	Statistics and Probability	3
MATH 665	Rational Numbers and Proportional Reasoning	3
MATH 667	Functions and Algebra II	3
MATH 690	Research Seminar	2
OPER 696	Applied Project	1-3
MATH 698	Thesis	1-3
STAT 508	Introduction to Social Statistics	3

STAT 543	Statistical Methods I	3
STAT 608	Statistics for Social Research	3
STAT 696	Applied Project	1-3
STAT 698	Thesis	1-3

Graduate program director
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Program website: sysm.vcu.edu (http://sysm.vcu.edu)

Department of Philosophy

Anthony Ellis
Professor and chair

philosophy.vcu.edu (http://philosophy.vcu.edu)

Philosophy aims at a deeper understanding of matters that should most concern the human race. Philosophical questions crop up in science, religion, art, morality, politics, medicine and in everyday life. Students enrolled in philosophy are encouraged to think seriously about fundamental issues in all these domains and to formulate coherent and well-grounded points of view. Because of its extensive use of critical and analytical reasoning, philosophy equips students for careers in medicine, law, business and other fields that require careful thought and the clear expression of ideas.

The Department of Philosophy offers a Bachelor of Arts in Philosophy. The department offers courses for students in other programs, as well as for those majoring in philosophy or religious studies.

Department of Physics

Shiv Khanna, Ph.D.
Professor and chair

physics.vcu.edu (http://www.physics.vcu.edu)

The Department of Physics offers programs leading to the Bachelor of Science in Physics and the Master of Science in Physics and Applied Physics. The department also offers an accelerated B.S.-M.S. program that allows students in the baccalaureate program to take graduate courses that will count toward the M.S. in Physics and Applied Physics degree.

- Physics and Applied Physics, Master of Science (M.S.) (p. 293)
- Physics and Applied Physics, Master of Science (M.S.), accelerated Bachelor of Science in Physics (B.S.) to master's (p. 295)

Physics and Applied Physics, Master of Science (M.S.)

Program goal

The Department of Physics teaches graduate students advanced concepts, applications and skills that reach to the frontiers of current research in physics. The master's program offers traditional core physics courses and a variety of specialized electives emphasizing the department's strengths in theoretical and experimental physics. Research interests include theoretical and experimental condensed matter physics, general relativity and cosmology.

Student learning outcomes

1. Students will achieve a broad knowledge of the principles of physics.
2. Students will demonstrate analytical problem-solving skills.
3. Students will demonstrate mastery of a topic at the frontier of physics research.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1	GRE
	Spring	Dec 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Students must have a minimum of 30 credit hours in undergraduate physics or engineering, of which at least 18 credit hours must be at the upper-level in physics.
2. Students must present satisfactory GRE scores.

Provisional admission may be granted where deficiencies exist. These deficiencies must be removed by the end of the first year of residence or its part-time equivalent, when the student's application will be re-examined. Courses that are designed to remove deficiencies will not be accepted for credit toward the graduate degree.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students are required to earn a minimum of 30 graduate credit hours with at least 15 credit hours at the 600 level. PHYS 690 and PHYS 697 may not exceed 15 of the required 30 credit hours.
2. M.S. plan of study: Students will choose a primary adviser during the first semester of study. At the end of the first semester, the student and adviser will propose an M.S. plan of study to the physics graduate curriculum committee. This plan will include the graduate courses and research subject matter to fulfill the student's individual career goals. Normally, students will select courses for their individual M.S. plans of study from the list of graduate courses in physics. The courses selected will include no fewer than nine credits of traditional physics core courses, such as PHYS 576 and PHYS 580, to provide a solid foundation in fundamental physics. However, students also may select graduate courses in chemistry, mathematics, computer science and engineering, as well as courses from the School of Medicine, when such courses are consistent with the student's career goals. The M.S. plan of study must be approved by the physics graduate curriculum committee. Courses taken outside this plan will not count toward the above general course requirements.
3. Thesis or non-thesis option: Each student must select either the thesis option or non-thesis option. Students selecting the thesis option must take at least nine credit hours of PHYS 697. No more than nine credit hours of directed research may be counted toward the 15 credit-hour, 600-level requirement. Students selecting the non-thesis option may take no more than three credit hours of PHYS 697. A student who elects the non-thesis option must pass a written comprehensive exam administered by the physics graduate curriculum committee.

Curriculum requirements

Thesis option

Course	Title	Hours
Core courses		
Select nine credits of the following:		9
NANO 570	Nanoscale Physics	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	
PHYS 571	Theoretical Mechanics	
PHYS 576	Electromagnetic Theory	
PHYS 580	Quantum Mechanics	
PHYS 641	Solid State Physics	
Additional course work		
PHYS 690	Research Seminar [1,3]	0-4
PHYS 697	Directed Research [2,3]	9
Electives (Choose courses from list of recommended electives below)		8-12
Total Hours		30

1

PHYS 690 may be repeated for a maximum of four credit hours toward the required 30 credit hours.

2

PHYS 697 can only satisfy up to nine credit hours of the 15 credit hours for 600-level and above.

3

PHYS 690 and PHYS 697 may not exceed 15 credit hours of the required 30 credit hours.

Total graduate credit hours required (minimum) 30

Non-thesis option

Course	Title	Hours
Core courses		
Select nine credits of the following:		9
NANO 570	Nanoscale Physics	
NANO 650	Experimental Techniques in Nanoscience I	
NANO 651	Experimental Techniques in Nanoscience II	

PHYS 571	Theoretical Mechanics	
PHYS 576	Electromagnetic Theory	
PHYS 580	Quantum Mechanics	
PHYS 641	Solid State Physics	
Additional course work		
PHYS 690	Research Seminar [1,3]	0-4
PHYS 697	Directed Research [2,3]	0-3
Electives (Choose courses from list of recommended electives below)		14-21
Total Hours		30

1

PHYS 690 may be repeated for a maximum of four credit hours toward the required 30 credit hours.

2

PHYS 697 can only satisfy up to nine credit hours of the 15 credit hours for 600-level and above.

3

PHYS 690 and PHYS 697 may not exceed 15 credit hours of the required 30 credit hours.

Total graduate credit hours required (minimum) 30

Recommended electives

Course	Title	Hours
CHEM 510	Atomic and Molecular Structure	3
CHEM 511	Chemical Thermodynamics and Kinetics	3
CHEM 610	Applied Quantum Chemistry	3
CHEM 612	Modern Statistical Mechanics: Fundamentals and Applications	3
EGRE 521	Advanced Semiconductor Devices	3
EGRE 620	Electron Theory of Solids	3
EGRE 623		3
NANO 570	Nanoscale Physics	3
NANO 571	Nanoscale Chemistry	3
NANO 650	Experimental Techniques in Nanoscience I	1.5
NANO 651	Experimental Techniques in Nanoscience II	1.5
NANO 660	Theoretical Studies of Nanostructures	3
PHYS 550	Techniques in Material Research	3
PHYS 571	Theoretical Mechanics	3
PHYS 573	Analytical Methods in Physics	3
PHYS 576	Electromagnetic Theory	3
PHYS 580	Quantum Mechanics	3
PHYS 591	Topics in Physics	1-3
PHYS 641	Solid State Physics	3
PHYS 661	Surface and Materials Physics	3
PHYS 691	Special Topics	3

Graduate program director
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Additional contact
Robert H. Gowdy, Ph.D.
Chair, Department of Physics
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Program website: physics.vcu.edu (http://physics.vcu.edu)

Physics and Applied Physics, Master of Science (M.S.), accelerated Bachelor of Science in Physics (B.S.) to master's

Students who are enrolled in the B.S. in Physics program may elect to take graduate courses that will count toward the M.S. in Physics and Applied Physics degree. Up to six hours of graduate credit may be earned in this way without any special provision. In order to offer more than six hours of pre-admission graduate credit toward the graduate degree, a student must apply to the Department of Physics graduate admission committee for admission to the accelerated B.S.-M.S. program.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Persons applying for admission to this program should (1) submit a curricular plan for completing the bachelor's degree within two years or its part-time equivalent, (2) indicate which graduate courses they intend to offer toward the physics master's degree and (3) have a B average or better. The M.S. degree completion form must include a memo from the Department of Physics graduate admission committee to indicate which graduate courses were taken under the accelerated B.S.-M.S. program.

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Program website: physics.vcu.edu (http://physics.vcu.edu)

Department of Political Science

Ravi Perry, Ph.D.
Associate professor and chair

politicalscience.vcu.edu (http://politicalscience.vcu.edu)

Political science is the study of governments, public policies and political processes, systems, and political behavior. Political science students gain a versatile set of skills that can be applied in a wide range of exciting careers in federal, state and local governments; law; business; international organizations; nonprofit associations and organizations;

campaign management and polling; journalism; education; electoral politics; and research.

The Department of Political Science faculty includes professors with a broad spectrum of expertise in public sector management, international affairs, genocide and human rights, feminist political theory, international and comparative health, Russian politics, human security, U.S. presidential decision-making for national security and foreign policy, Asian politics, Middle Eastern politics and societies, and U.S. information/secrecy politics.

Department of Psychology

Michael Southam-Gerow, Ph.D.
Professor and chair

Linda E. Zyzniewski, Ph.D.
Associate professor and director of undergraduate programs

Dorothy E. Fillmore
Director of academic operations

psychology.vcu.edu (http://www.psychology.vcu.edu)

In addition to the Bachelor of Science in Psychology, the Department of Psychology offers instruction in clinical, counseling, health and general psychology leading to the Doctor of Philosophy degree. Students in all doctoral degree programs are educated first as psychologists and then helped to develop competence in a more specialized area relevant to their scholarly and professional objectives. In addition, special training and experience in college teaching is available.

Admission requirements for doctoral programs

In addition to the general requirements for admission to the graduate programs in the Graduate School (in the Graduate study (p. 34) section of this bulletin), the following requirements represent the minimum acceptable standards for admission:

- Graduation with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology
- 18 semester hours of undergraduate course work in psychology (This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.)
- An undergraduate record indicating superior academic potential
- Satisfactory performance on the GRE
- Three letters of recommendation from previous instructors
- A personal interview may be required at the discretion of the department

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed. See the admission requirements summary tables to view admission deadlines for each of the Ph.D. programs: clinical psychology, counseling psychology, general psychology (biopsychology, developmental psychology, social psychology) and health psychology.

Applicants to the general psychology program should specify to which of the three divisions they are applying (i.e., biopsychology, developmental or social).

Transfer credits for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements for doctoral programs

The following requirements are in addition to those described for the graduate programs in the Graduate School and the College of Humanities and Sciences section of this bulletin.

All students are required to complete a core curriculum of 15 credits (or its equivalent for students entering with a master's degree).

Students who receive grades of B or better in each of the department core courses are considered to have fulfilled the university requirements of a master's level comprehensive examination and will then officially be considered candidates for the Master of Science degree. Students who receive grades of C or lower in two or more department core courses will have failed the comprehensive examination and will be dismissed automatically from the program. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program.

Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee.

Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credits of psychology courses, constitutes automatic dismissal of a student from the program.

All students are required to complete a master's thesis and to defend it successfully in an oral examination. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee.

The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six semester credits in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.

Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements

for the master's degree. The program committee reviews the student's request and approves or disapproves the request.

The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs.

With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major.

Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit will vary depending on the program. Internship will be one-half credit per semester.

A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 semester credits in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree.

Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's graduate student handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

- Clinical Psychology, Doctor of Philosophy (Ph.D.) with a concentration in behavioral medicine (p. 297)
- Clinical Psychology, Doctor of Philosophy (Ph.D.) with a concentration in clinical child (p. 300)
- Counseling Psychology, Doctor of Philosophy (Ph.D.) (p. 302)
- Health Psychology, Doctor of Philosophy (Ph.D.) (p. 305)
- Psychology, Doctor of Philosophy (Ph.D.) with a concentration in developmental psychology (p. 308)
- Psychology, Doctor of Philosophy (Ph.D.) with a concentration in social psychology (p. 311)

Clinical Psychology, Doctor of Philosophy (Ph.D.) with a concentration in behavioral medicine

Program accreditation
American Psychological Association

Program goal

The Doctor of Philosophy in Clinical Psychology offered by VCU is accredited by the American Psychological Association. The clinical psychology program at VCU is committed to excellence in scholarship and clinical training from the scientist-practitioner model. The doctoral program in clinical psychology is designed to require four years of academic work plus one additional year devoted to a full-time APA-accredited predoctoral internship placement. The first three years of graduate school residence concentrate on course work, thesis research and practicum experience, with the fourth year largely reserved for the completion of off-campus practicum experience and dissertation research. A student entering the program with a master's degree and extensive clinical experience may petition to reduce the practicum requirements by one year, resulting in three rather than four years of residency. All academic training occurs while the student is in residence at VCU.

The goal of the program is to train clinical psychologists in scientific principles and evidence-based theoretical models to guide the study and treatment of psychopathology for diverse groups of individuals. Accordingly, student learning outcomes include demonstrating competence in scientific research; the delivery of clinical services and related documentation; and cultural competence in science and practice. The clinical program is designed to provide students with foundational clinical and research competencies in two broad specialty areas: behavioral medicine and child and adolescent. The concentration in behavioral medicine emphasizes training in prevention, program development, consultation, empowerment and health promotion. The concentration in clinical child focuses on developmental psychopathology and treatment of underserved youth in schools and community settings. The program also has a strong focus on meeting the needs of underserved populations within these two broad specialty areas. The program prepares students for faculty, staff, administrative and practitioner positions in university departments of psychology, medical schools, community mental health centers, clinics, hospitals, prisons, state departments of mental health and private practice.

The Center for Psychological Services and Development, a campus-based community service agency operated by the department, provides training opportunities for graduate students in all departmental programs, including practicum and research training for graduate students in the clinical psychology program. A wide variety of other on- and off-campus practicum placements also are available.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will demonstrate competence in scientific research.
2. Students will demonstrate competence in the delivery of clinical services and related documentation.
3. Students will demonstrate cultural competence in science and practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the clinical psychology Ph.D. program are required to earn a minimum of 87.5 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (14 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the

thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.

4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3
PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 675	Ethical Principles of Psychology [1]	2
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Required clinical courses		
PSYC 616	Psychopathology [1]	3
PSYC 627	Research Methods in Clinical Psychology [1]	3
PSYC 643	Principles of Psychological Measurement [1]	2
PSYC 644	Individual Tests of Intelligence [1]	3
PSYC 651	Theories of Counseling and Interviewing [1]	2
PSYC 660	Health Psychology	3
PSYC 661	Clinical Applications of Health Psychology	3
PSYC 662	Diagnostic and Behavioral Assessment [1]	3
PSYC 667	Behavior Therapy [1]	3
Research and clinical practica		
PSYC 690	Research Practicum [1]	1
PSYC 694	Clinical Practicum (variable credit course repeated for maximum of 14 credit hours for Ph.D., six credit hours for M.S.) [1,2]	14
Developmental course		
PSYC 603	Developmental Processes	3
Social aspects of behavior course		
PSYC 630	Social Psychology	3
Cultural/individual diversity course		
PSYC 677	Minority Issues in Mental Health	3
Electives		
PSYC electives at 600-level or higher, including four credits required to meet the M.S. requirements		3
Approved internship		
PSYC 696	Internship (0.5 credit hours for three consecutive semesters)	1.5
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Total Hours		87.5

[1] Required course for M.S. degree (49 credit hours minimum)

[2] Up to two credit hours of PSYC 694 may be waived depending on experience and ability.

Total graduate credit hours required (minimum) 87.5

Graduate program director
Michael A. Southam-Gerow, Ph.D.
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Phone: (804) 827-0585

Additional contact
Rosalie Corona
Associate professor and director, clinical psychology training program
Email: racorona@vcu.edu
Phone: (804) 828-8059

Program website: psychology.vcu.edu/clinical (http://www.psychology.vcu.edu/clinical)

Clinical Psychology, Doctor of Philosophy (Ph.D.) with a concentration in clinical child

Program accreditation
American Psychological Association

Program goal

The Doctor of Philosophy in Clinical Psychology offered by VCU is accredited by the American Psychological Association. The clinical psychology program at VCU is committed to excellence in scholarship and clinical training from the scientist-practitioner model. The doctoral program in clinical psychology is designed to require four years of academic work plus one additional year devoted to a full-time APA-accredited predoctoral internship placement. The first three years of graduate school residence concentrate on course work, thesis research and practicum experience, with the fourth year largely reserved for the completion of off-campus practicum experience and dissertation research. A student entering the program with a master's degree and extensive clinical experience may petition to reduce the practicum requirements by one year, resulting in three rather than four years of residency. All academic training occurs while the student is in residence at VCU.

The goal of the program is to train clinical psychologists in scientific principles and evidence-based theoretical models to guide the study and treatment of psychopathology for diverse groups of individuals. Accordingly, student learning outcomes include demonstrating competence in scientific research; the delivery of clinical services and related documentation; and cultural competence in science and practice. The clinical program is designed to provide students with foundational clinical and research competencies in two broad specialty areas: behavioral medicine and child and adolescent. The concentration in behavioral medicine emphasizes training in prevention, program development, consultation, empowerment and health promotion. The concentration in clinical child focuses on developmental psychopathology and treatment of underserved youth in schools and community settings. The program also has a strong focus on meeting the needs of underserved populations within these two broad specialty areas. The program prepares students for faculty, staff, administrative and practitioner positions in university departments of psychology, medical schools, community mental health centers, clinics, hospitals, prisons, state departments of mental health and private practice.

The Center for Psychological Services and Development, a campus-based community service agency operated by the department, provides training opportunities for graduate students in all departmental programs, including practicum and research training for graduate students in the clinical psychology program. A wide variety of other on- and off-campus practicum placements also are available.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will demonstrate competence in scientific research.
2. Students will demonstrate competence in the delivery of clinical services and related documentation.
3. Students will demonstrate cultural competence in science and practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the clinical psychology Ph.D. program are required to earn a minimum of 87.5 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (14 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.
4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3
PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 675	Ethical Principles of Psychology [1]	2
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Required clinical courses		
PSYC 627	Research Methods in Clinical Psychology [1]	3
PSYC 643	Principles of Psychological Measurement [1]	2
PSYC 644	Individual Tests of Intelligence [1]	3
PSYC 650	Advanced Child Psychopathology [1]	3
PSYC 651	Theories of Counseling and Interviewing [1]	2
PSYC 652	Child and Adolescent Psychotherapy [1]	3
PSYC 662	Diagnostic and Behavioral Assessment [1]	3
Research and clinical practica		
PSYC 690	Research Practicum [1]	1
PSYC 694	Clinical Practicum (variable credit course repeated for maximum of 16 credit hours for Ph.D., six credit hours for M.S.) [1,2]	16
Development course		
PSYC 603	Developmental Processes	3
Social aspects of behavior course		
PSYC 630	Social Psychology	3
Cultural/individual diversity course		
PSYC 677	Minority Issues in Mental Health	3
Electives		
PSYC electives at 600-level or higher, including three credits required to meet the M.S. requirements		7
Approved internship		
PSYC 696	Internship (0.5 credit hours for three consecutive semesters)	1.5
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Total Hours		87.5

[1] Required course for M.S. degree (49 credit hours minimum)

[2] Up to four credit hours of PSYC 694 may be waived depending on experience and ability.

Total graduate credit hours required (minimum) 87.5

Graduate program director

Michael A. Southam-Gerow, Ph.D.
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Additional contact
Rosalie Corona
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Phone: (804) 828-8059

Program website: psychology.vcu.edu/clinical (http://www.psychology.vcu.edu/clinical)

Counseling Psychology, Doctor of Philosophy (Ph.D.)

Program accreditation
American Psychological Association

Program goal

The Doctor of Philosophy in Counseling Psychology offered at VCU is accredited by the American Psychological Association. The program emphasizes the scientist-practitioner model and prepares students for research and service in professional psychology, including positions in university academic and medical school departments, counseling centers, mental health agencies and hospitals, physical health facilities, and other organizational settings.

The counseling psychology program emphasizes the enhancement of life skills and personal competence. Typical subspecializations include disease prevention and health promotion, career and life planning, work with medical populations, college students, community outreach, interpersonal processes, group counseling, marriage and family counseling, multiculturalism, and sport psychology.

The Center for Psychological Services and Development, a campus-based community service agency operated by the department, provides training opportunities for graduate students in all departmental programs, including practicum and research training for graduate students in the clinical psychology program. A wide variety of other on- and off-campus practicum placements also are available.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will design, carry out and write publishable scientific research.
2. Students will demonstrate excellence in professional practice of health care psychology.
3. Students will demonstrate cultural sensitivity in research and practice.
4. Students will demonstrate competent integration of science and practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

The finalists for admission will be interviewed on site (or by phone) by counseling faculty.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the counseling psychology Ph.D. program are required to earn a minimum of 87.5 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (14 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of

these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.

4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3
PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 675	Ethical Principles of Psychology [1]	2
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Required counseling courses		
PSYC 608	Research in Counseling Psychology	3
PSYC 611	Contemporary Issues, Supervision and Leadership in Counseling Psychology	3
PSYC 616	Psychopathology [1]	3
PSYC 623	Counseling Theories and Personality [1]	1
PSYC 625	Career Development and Occupational Health [1]	3
PSYC 643	Principles of Psychological Measurement [1]	2
PSYC 644	Individual Tests of Intelligence [1]	3
PSYC 645	Assessment of Personality [1]	3
PSYC 651	Theories of Counseling and Interviewing [1]	3
PSYC 655	Community Interventions: Development, Implementation and Evaluation	3
or PSYC 660	Health Psychology	
PSYC 676	Personal Awareness in Multicultural Counseling [1]	3
Research and counseling practica		
PSYC 693	Counseling Practicum (six credit hours for M.S.) [1]	12
Developmental course		
PSYC 603	Developmental Processes	3
Social aspects of behavior course		
PSYC 630	Social Psychology (or other social aspects course as approved by graduate program director)	3
Approved internship		
PSYC 696	Internship (0.5 credit hours for three consecutive semesters)	1.5
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Electives		4
PSYC 695	Practicum in Clinical or Counseling Supervision (highly recommended)	
Student should consult with program director for other recommendations.		
Total Hours		87.5

1

Required course for M.S. degree (53 credit hours minimum)

Total graduate credit hours required (minimum) 87.5

Graduate program director
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Program website: psychology.vcu.edu/counseling (http://www.psychology.vcu.edu/counseling)

Health Psychology, Doctor of Philosophy (Ph.D.)

Program goal

The Doctor of Philosophy in Health Psychology offered by VCU is an experimentally oriented program that is designed to train students to contribute to the knowledge of psychological contributions to health and illness via training in basic and clinical research. Students completing the Ph.D. in Health Psychology will not be eligible for licensure. Research in health psychology examines the causes and development of illness, methods to help individuals develop healthy lifestyles to promote good health and prevent illness, the treatment individuals receive for their medical problems, the effectiveness with which individuals cope with and reduce stress and pain, biopsychosocial connections with immune functioning, and factors in the recovery, rehabilitation and psychosocial adjustment of patients with serious health problems. Thus, graduates from the Ph.D. program in Health Psychology are prepared for work in a range of settings including colleges and universities, medical centers, research centers, nonprofit agencies and local, state and national government.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will demonstrate understanding of the models, theories and processes of health psychology.
2. Students will demonstrate knowledge of the biological, cognitive, attitudinal, social and cultural underpinnings of health.
3. Students will demonstrate knowledge of primary and secondary prevention of disease in a diverse range of communities and populations.
4. Students will produce a rigorously designed research project in the field of health psychology.
5. Students will adhere to the highest standards of ethics in their research, teaching and applied practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the health psychology Ph.D. program are required to earn a minimum of 80 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (13-15 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.
4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3

PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Responsible conduct of research course (select one)		1-2
OVPR 601	Scientific Integrity	
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
or PSYC 675	Ethical Principles of Psychology	
Required health courses		
PSYC 660	Health Psychology [1]	3
PSYC 679	Culture, Ethnicity and Health	3
PSYC 691	Special Topics (research methods in health psychology or approved equivalent) [1]	3
Applied course		
PSYC 631	Evaluation Research: Psychological Perspectives	3
or PSYC 655	Community Interventions: Development, Implementation and Evaluation	
Additional health-related courses		
Select six credits from the following:		6
EPID 603	Public Health Policy and Politics	
HADM 615	Health Care Politics and Policy	
PHTX 548	Drug Dependence	
PSYC 622	Physiological Correlates of Emotion	
PSYC 635	Psychology of Health and Health Care in the Elderly	
PSYC 666	Crisis Intervention: Theory, Research and Practice	
PSYC 691	Special Topics (child health psychology, cancer prevention and control, occupational health psychology, tobacco control in 21st century)	
SBHD 608	Health Communication	
Independent readings and research [1,2]		
PSYC 671	Readings and Research	3
PSYC 690	Research Practicum	3
Additional course work		
ALHP 716	Grant Writing and Project Management in Health Related Sciences	3
or PSYC 700	Grant Writing	
PSYC 603	Developmental Processes (or another course in developmental psychology approved by the program director)	3
PSYC 630	Social Psychology (or another course in social psychology approved by the program director)	3
PSYC 795	Practicum in the Teaching of College Psychology	3
Methodology/statistics course		
Select at least one of the following:		3
BIOS 531	Clinical Epidemiology	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
BIOS 647	Survival Analysis	
EDUS 651	Topics in Education	
EPID 571	Principles of Epidemiology	
EPID 606	Epidemiologic Methods	
HADM 762	Health Services Research Methods II	
MGMT 691	Topics in Management (CARMA)	
NURS 772	Qualitative Research	
PSYC 682	Advanced Multivariate Methods in Psychology	
PSYC 683	Multilevel Modeling	
PSYC 702	Causal Analysis for Organizational Studies	
SBHD 610	Behavioral Measurement	
SBHD 633	Structural Equation Modeling	
SCMA 643	Applied Multivariate Methods	
SOCY/PADM 605	Survey Research Methods	
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	
Recommended electives		
Select seven to eight credit hours from the following:		7-8
ALHP 701	Health Services Delivery Systems	
BIOL 524	Endocrinology	
EPID 603	Public Health Policy and Politics	
GRTY 601	Biological and Physiological Aging	
GRTY 627	Psychology of Health and Health Care for the Elderly	
HADM 615	Health Care Politics and Policy	
HADM 626	International Health	
PHTX 548	Drug Dependence	
PHTX 614	Foundation in Psychoneuroimmunology	
PSYC 622	Physiological Correlates of Emotion	
PSYC 635	Psychology of Health and Health Care in the Elderly	
PSYC 666	Crisis Intervention: Theory, Research and Practice	
PSYC 691	Special Topics (child health psychology, cancer prevention and control, occupational health psychology, tobacco control in 21st century)	
SBHD 605	Introduction to Social and Behavioral Health	
SBHD 608	Health Communication	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Total Hours		80

1 Required course for M.S. degree (40 credit hours minimum)

2

At least three credit hours of either course required for M.S.; both required for Ph.D.

Total graduate credit hours required (minimum) 80

Graduate program director
Michael A. Southam-Gerow, Ph.D.
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Additional contact
Paul Perrin, Ph.D.
Associate professor and director, health psychology program
Email: pperrin@vcu.edu (PPerrin@vcu.edu)
Phone: (804) 827-3894

Program website: psychology.vcu.edu/health (http://www.psychology.vcu.edu/health/index.shtml)

Psychology, Doctor of Philosophy (Ph.D.) with a concentration in developmental psychology

Program goal

The Doctor of Philosophy in Psychology offered by VCU prepares students for basic or applied research and includes three specialty areas: biopsychology, developmental psychology and social psychology. The concentration in developmental psychology trains students for work in either college or university academic departments or applied settings. Applied developmentalists work in a variety of settings and programs (violence prevention, community intervention, schools, family service agencies, nonprofit agencies, health care settings, disability agencies) with a variety of human populations (infants and young children, school-age children, adolescents, at-risk youth, incarcerated youth and adults, parents, older adults, persons with disabilities); they do not offer counseling/therapy services.

The Center for Psychological Services and Development, a campus-based community service agency operated by the department, provides training opportunities for graduate students in all departmental programs, including practicum and research training for graduate students in the clinical psychology program. A wide variety of other on- and off-campus practicum placements also are available.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will demonstrate their understanding of the models and theories of developmental psychology
2. Students will use scientifically sound methodologies in their research.
3. Students will adhere to the highest standards of ethics in their research, teaching and applied practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department.

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Applicants to the psychology doctoral program should specify to which of the three divisions they are applying (i.e., biopsychology, developmental or social).

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the psychology Ph.D. program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (13-15 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.
4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3
PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Responsible conduct or research course [1]		
Select one of the following:		1-2
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
PSYC 675	Ethical Principles of Psychology	
Developmental psychology concentration core courses		
PSYC 603	Developmental Processes [1]	3
PSYC 605	Social Development [1]	3
PSYC 613	Cognitive Development [1]	3
PSYC 636	Research Methods in Developmental Psychology [1]	3
PSYC 643	Principles of Psychological Measurement [1]	2
PSYC 671	Readings and Research (at least two credit hours required for M.S.) [1]	5
or PSYC 690	Research Practicum	
Cultural/individual diversity course		
Select three credit hours from the following: [1, 2]		3
PSYC 679	Culture, Ethnicity and Health	
PSYC 691	Special Topics (African-American family)	
Applied courses		
Select six credit hours from the list below or other applied-related course approved by adviser:		6
PSYC 631	Evaluation Research: Psychological Perspectives	
PSYC 655	Community Interventions: Development, Implementation and Evaluation	
PSYC 700	Grant Writing	
PSYC 795	Practicum in the Teaching of College Psychology	
SBHD 639	Intervention Development and Implementation	
Methodology/statistics course		
Select three credit hours from the list below or other relevant methodology/statistics-related course approved by adviser:		3
NURS 772	Qualitative Research	
PSYC 682	Advanced Multivariate Methods in Psychology	
PSYC 683	Multilevel Modeling	
SBHD 638	Applications in Qualitative Research Methods	
Recommended electives		
Select from the following:		8
GRTY 601	Biological and Physiological Aging	
GRTY 602	Psychology of Aging	
GRTY 605	Social Science Research Methods Applied to Gerontology	
GRTY 606	Aging and Human Values	
HGEN 620	Principles of Human Behavioral Genetics	
IDDS 600	Interdisciplinary Studies in Developmental Disabilities: Teamwork in Serving Persons with Developmental Disabilities	
IDDS 691	Special Topics in Developmental Disabilities	
IDDS 692	Directed Study in Developmental Disabilities	
PSYC 606	Development in Middle Childhood	
PSYC 614	Development in Infancy and Early Childhood	
PSYC 615	Aging and Mental Disorders	
PSYC 616	Psychopathology	
PSYC 628	Psychology of Adolescence	
PSYC 630	Social Psychology	
PSYC 635/ GRTY 627	Psychology of Health and Health Care in the Elderly	
PSYC 640	Parenting	
PSYC/GRTY 641	Survey of Psychological Assessment and Treatment of the Older Adult	
PSYC 644	Individual Tests of Intelligence	
PSYC 645	Assessment of Personality	
PSYC 650	Advanced Child Psychopathology	
PSYC 655	Community Interventions: Development, Implementation and Evaluation	
PSYC 659	Seminar in Consultation Psychology	
PSYC 660	Health Psychology	
PSYC 671	Readings and Research	
PSYC 690	Research Practicum	
PSYC 691	Special Topics (child health, African-American family, school mental health)	
SEDP 705	Seminar on Disability Policy	
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Total Hours		72

[1] Required course for M.S. degree (40 credit hours minimum)

[2] Other portfolio, diversity-related or independent study courses demonstrating in-depth knowledge about diversity in human development areas may be approved by the developmental psychology faculty.

Total graduate credit hours required (minimum) 72

Note: Students specializing in lifespan development and gerontology must take the following set of gerontology courses in addition to other developmental and core requirements. These courses will result in a Certificate in Aging Studies from the Department of Gerontology.

Course	Title	Hours
GRTY 601	Biological and Physiological Aging	3
GRTY/PSYC 602	Psychology of Aging	3
GRTY 605	Social Science Research Methods Applied to Gerontology	3
GRTY 692	Independent Studies	2
Six additional hours of gerontology electives, chosen with adviser		6

Graduate program director
Michael A. Southam-Gerow, Ph.D.
Professor, associate chair and director of graduate studies
Email: masouthamger@vcu.edu
Phone: (804) 827-0585

Additional contact
Terri N. Sullivan, Ph.D.
Professor and director, developmental psychology concentration
Email: tnsulliv@vcu.edu
Phone: (804) 828-9304

Program website: psychology.vcu.edu/developmental (http://www.psychology.vcu.edu/developmental)

Psychology, Doctor of Philosophy (Ph.D.) with a concentration in social psychology

Program goal

The Doctor of Philosophy in Psychology offered by VCU prepares students for basic or applied research and includes three specialty areas: biopsychology, developmental psychology and social psychology. The concentration in developmental psychology trains students for work in either college or university academic departments or applied settings. Applied developmentalists work in a variety of settings and programs (violence prevention, community intervention, schools, family service agencies, nonprofit agencies, health care settings, disability agencies) with a variety of human populations (infants and young children, school-age children, adolescents, at-risk youth, incarcerated youth and adults, parents, older adults, persons with disabilities); they do not offer counseling/therapy services.

The Center for Psychological Services and Development, a campus-based community service agency operated by the department, provides training opportunities for graduate students in all departmental programs, including practicum and research training for graduate students in the clinical psychology program. A wide variety of other on- and off-campus practicum placements also are available.

The department maintains laboratory facilities for research in the areas of behavioral assessment, behavioral medicine, developmental, learning, behavioral pharmacology, psychophysiology, psychotherapy process, social perception, social influence and group dynamics. Opportunities for field research also are available in a variety of settings.

Student learning outcomes

1. Students will demonstrate mastery of basic principles, theories and findings in the field of social psychology.
2. Students will produce a rigorously designed research project in the field of social psychology.
3. Students will write a paper based on a research project that is of publishable quality.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 1	GRE-General

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must have graduated with a bachelor's degree from an accredited college or university, but not necessarily with a major in psychology.
2. Applicants must present 18 semester hours of undergraduate course work in psychology. This is the minimal, but not optimal, number of hours for an applicant to be considered for admission. Included must be each of the following courses: general psychology, statistics and experimental psychology. Exceptionally well-qualified applicants with less than a major in psychology, or applicants whose undergraduate work is considered outdated by the admissions committee, may be advised to complete some additional undergraduate courses at the beginning of their graduate study program.
3. Applicants must present an undergraduate record indicating superior academic potential.
4. Students must show proof of satisfactory performance on the GRE.
5. Three letters of recommendation from previous instructors are required.
6. A personal interview may be required at the discretion of the department.

The number of students who can be admitted is limited by the facilities and staff available. All applicants will be notified of the decision made. The screening process may begin as early as Jan. 1. First offers of admission are made by April 1. By June 1, after other offers to alternates have been made and final acceptances by students have been received, admissions may be closed.

Applicants to the psychology doctoral program should specify to which of the three divisions they are applying (i.e., biopsychology, developmental or social).

Transfer credit hours for graduate work at other institutions will be evaluated after the completion of nine semester hours in the department.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the Ph.D. degree must be completed within eight years of the first enrollment.

1. Credit hour requirements: Students in the psychology Ph.D. program are required to earn a minimum of 72 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Grade requirement: Receipt of a grade of C or lower in two courses, or grades of C or lower in more than six credit hours of psychology courses, constitutes automatic dismissal of a student from the program.
3. Master's-level candidacy and requirements: All students in the Department of Psychology are required to complete a department core curriculum (13-15 credit hours) or its equivalent for students entering with a master's degree. Students who receive a grade of C or lower in one of the department core courses must either (a) satisfactorily complete a re-examination of the material covered in the course within one semester following the receipt of the grade (this re-examination is to be arranged and evaluated by the course instructor) or (b) repeat the course for credit the next time it is offered and receive a grade of B or better. Regardless of which of these approaches is chosen, the students will be given only one opportunity to demonstrate that they have mastered the course material. Students who either fail the re-examination or repeat the course and receive a grade of C or lower will have failed the comprehensive examination and will be dismissed from the program. Additional courses and training experiences will be determined in consultation with and subject to the approval of the student's faculty adviser and graduate program committee. All students are required to complete a master's thesis and to defend it successfully in an oral examination. The successful proposal of the thesis will elevate the student to master's degree candidacy status. Ideally, the thesis should be publishable as a piece of research and make a contribution to the field of psychology. Students who have previously completed a master's thesis in psychology at another university may have the thesis requirement waived if the thesis is accepted by their graduate program committee. The residence requirement for the master's degree is 18 hours, nine in each of two consecutive semesters. Completion of the degree usually requires four semesters. At least six credit hours in PSYC 798 must be completed, and no more than six can be counted toward the M.S. degree.
4. Doctoral candidacy and requirements: Students are obligated to request, in writing from their program committees, continuation of study beyond the master's degree and approval of their doctoral plan of study. Application from a student for continuation beyond the master's level will be evaluated by the appropriate program committee after completion of all requirements for the master's degree. The program committee reviews the student's request and approves or disapproves the request. The student must pass a written preliminary examination to become a doctoral candidate. Students are required to complete this requirement prior to defense of their dissertations and prior to leaving on internship for students in the clinical and counseling psychology programs. With the consent of the program committee, doctoral students may design a minor consisting of courses in departments other than psychology or courses in an area of psychology other than the major. Both the clinical and counseling psychology programs require completion of applied practica and a one-year predoctoral internship approved by the program committee. Research practica are required by all programs. Practicum credit hours will vary depending on the program. Internship will be one-half credit hour per semester. A dissertation requiring the planning, completion and oral defense of an original research project is an integral part of the doctoral program. At least 12 credit hours in PSYC 898 must be completed, and no more than 12 can be counted toward the Ph.D. degree. Completion of the entire program usually requires four to six years (including the internship year for students in the clinical and counseling programs). Candidates must complete all requirements for the Ph.D. degree within an eight-year period from the date of admission to the graduate program unless permission is granted for an extension. In some cases, specific programs and divisions may have requirements in addition to those stated here.

A more detailed description of the requirements for each of the graduate programs is included in the Department of Psychology's Graduate Student Handbook, which is provided to each incoming graduate student. Visit the website for more information: psychology.vcu.edu (http://www.psychology.vcu.edu).

Curriculum requirements

Course	Title	Hours
Department core courses		
PSYC 619	Learning and Cognition [1]	3
PSYC 629	Biological Basis of Behavior [1]	3
PSYC 673	Topics in Diversity I [1]	1
PSYC 674	Topics in Diversity II [1]	1
PSYC 680	Statistics in Psychological Research I [1]	3
PSYC 681	Statistics in Psychological Research II [1]	3
Responsible conduct of research course [1]		1-2
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
PSYC 675	Ethical Principles of Psychology	
Social psychology concentration core courses		
PSYC 610	Attitude Theory and Research [1]	3
PSYC 630	Social Psychology [1]	3
PSYC 632	Research Methods in Social Psychology [1]	3
PSYC 634	Attribution and Social Cognition [1]	3
PSYC 671	Readings and Research [1]	3
PSYC 690	Research Practicum	3
One advanced, three-credit course in statistics (e.g., structural equation modeling, meta-analysis), with approval of the program director		3
Social seminars		
Select nine credit hours from the following or choose other social psychology-relevant courses approved by adviser:		9
PSYC 631	Evaluation Research: Psychological Perspectives	
PSYC 688	The Self and Identity	
PSYC 691	Special Topics ((interpersonal processes, social influence, social and developmental practicum, positive psychology)	
Recommended concentration electives		
Select nine to 10 credit hours from the following:		9-10
HGEN 620	Principles of Human Behavioral Genetics	
PSYC/GRTY 602	Psychology of Aging	
PSYC 603	Developmental Processes	
PSYC 604	Social Psychology of Business and Industry	
PSYC 605	Social Development	
PSYC 613	Cognitive Development	
PSYC 631	Evaluation Research: Psychological Perspectives	
PSYC 633	Group Dynamics	
PSYC 659	Seminar in Consultation Psychology	
PSYC 660	Health Psychology	
PSYC 668	Interpersonal Psychotherapy: Social Psychological Analysis	
PSYC 671	Readings and Research	
PSYC 688	The Self and Identity	
PSYC 690	Research Practicum	
PSYC 691	Special Topics	
PSYC 700	Grant Writing	
PSYC/MGMT 702	Causal Analysis for Organizational Studies	
PSYC 795	Practicum in the Teaching of College Psychology	
SBHD 610	Behavioral Measurement	
STAT 643	Applied Linear Regression	
STAT 744	Regression II	
Thesis/dissertation		
PSYC 798	M.S. Thesis [1]	6
PSYC 898	Doctoral Dissertation	12
Total Hours		72

[1] Required course for M.S. degree (40 credit hours minimum)

Total graduate credit hours required (minimum) 72

Graduate program director
Michael A. Southam-Gerow, Ph.D.
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Additional contact
David S. Chester, Ph.D.
Assistant professor and director, social psychology concentration
Email: dschester@vcu.edu
Phone: (804) 828-7624

Program website: psychology.vcu.edu/social (http://www.psychology.vcu.edu/social)

Department of Sociology

Jennifer Johnson, Ph.D.
Associate professor and chair

sociology.vcu.edu (http://www.sociology.vcu.edu)

The sociology department at VCU provides an engaged, learner-centered experience for our undergraduate and graduate students through active involvement in faculty research and community development. Through cutting-edge research, excellent undergraduate and graduate teaching focused on critical thinking, exciting applied opportunities, vital service and community outreach both nationally and internationally, and preparation of students for a wide range of jobs, sociology plays a central role in quality liberal arts education. Sociology is a "social science"; it is a discipline grounded in using sociological theory and the scientific method to create the knowledge necessary for understanding and improving social life. Using theory as a foundation for analysis, sociologists collect and analyze empirical data useful in making decisions related to public life, such as social and economic policy, and private life, such as family

and interpersonal health. It is this relationship between sociological theory, as the foundation of critical thinking, and the scientific method, as the guiding principles of analysis, which makes sociology a rapidly expanding field with expertise increasingly sought after by those who craft policies and create programs.

The Department of Sociology offers a Bachelor of Science in Sociology at the undergraduate level, as well as a Master of Science at the graduate level.

Sociology, Master of Science (M.S.)

Program goals

The goal of the graduate program in sociology is to facilitate the development of theoretical, methodological and substantive competence appropriate for students' interests and career goals. In keeping with VCU's role as an urban institution, the program focuses on the study of public sociology, inequality, social problems, policy alternatives and strategies for change. In addition to its program on the VCU campus, the department offers an online concentration in digital sociology.

Student learning outcomes

1. Students will demonstrate a mastery of the key concepts, including diversity and inequality, developed by classical and modern sociological theorists.
2. Students will organize and integrate information into a cohesive overview of current knowledge; demonstrate the ability to critically evaluate the meaning, value and contribution of published literature in the field.
3. Students will demonstrate the ability to design and implement an appropriate collection and analysis of data, which is a critical response to theory and current literature in the field of sociology.
4. Students will demonstrate the ability to draw reasoned conclusions based on qualitative and/or quantitative evidence relevant to the discipline of sociology.
5. Students will demonstrate the ability to present their work as a cohesive artifact to their relevant publics.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE-General

Note: A limited number of assistantships are available for qualified applicants. Applicants for assistantships should have their files complete by April 1. Individuals not applying for assistantships should file their applications for graduate study as early as possible to permit adequate review.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

Preference is given to students who have a substantial background in sociology, such as an undergraduate major or minor or 18 or more college-level credit hours in sociology. Students with an undergraduate or graduate degree in a closely related field will also receive consideration for admission.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the following requirements apply:

1. Credit hour requirements: Students in the M.S. in Sociology program are required to earn a minimum of 36 graduate-level credit hours

beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.

2. Transfer credits: A maximum of six credit hours of elective credit taken at another university or in another department can be applied to the M.S. in Sociology. The courses applied to the degree should be relevant to the student's primary area of study and get prior approval from the graduate program director.
3. Other requirements: The sociology master's degree may be pursued either on the VCU campus or online. Students who wish to complete the M.S. degree online should consult the digital sociology concentration area page for more information.

Curriculum requirements

Course	Title	Hours
Required core courses		
SOCY 502	Contemporary Sociological Theory	3
SOCY/STAT 508	Introduction to Social Statistics	3
SOCY 601	Sociological Research Methods	3
SOCY 602	Applications of Sociological Research Methods	3
SOCY 699	Seminar in Sociological Practice (course may be repeated; six credits required for degree) [1]	6
Electives		
A maximum of six credits from outside the sociology department and a maximum of three credits of SOCY 692 may be presented toward the degree with the prior approval of the graduate program director.		18
Total Hours		36

[1]

A maximum of six credits of SOCY 699 may be presented toward the degree.

Total graduate credit hours required (minimum) 36

Graduate program director
Tara M. Stamm, Ph.D.
Email: tmstamm@vcu.edu
Phone: (804) 828-9432

Program website: sociology.vcu.edu (http://www.sociology.vcu.edu)

Sociology, Master of Science (M.S.) with a concentration in digital sociology

Program goals

The purpose of the M.S. in Sociology with a concentration in digital sociology is to teach students to analyze digitally native data through the lens of social justice. The program aims to prepare graduates to shape emerging local, national and global conversations about big data, privacy, algorithms, inequality and social movements. The sociology department believes in the importance of developing new ways of doing sociology that are both public and critical. The program brings together a cross-disciplinary course sequence in methods, theory, big data analysis, data visualization, social network analysis, digital sociology, public sociology and digital social problems, culminating in two practicums. Students create meaningful projects from the beginning of the program, building a digital portfolio exhibiting their proficiency in applying sociological theory, methodology and critical analysis skills to the digital world.

Learning outcomes

1. Students will demonstrate a mastery of the key concepts, including diversity and inequality, developed by classical and modern sociological theorists.
2. Students will organize and integrate information into a cohesive overview of current knowledge and demonstrate the ability to critically evaluate the meaning, value and contribution of published literature in the field.
3. Students will demonstrate the ability to design and implement an appropriate collection and analysis of data, which is a critical response to theory and current literature in the field of sociology.
4. Students will demonstrate the ability to draw reasoned conclusions based on qualitative and/or quantitative evidence relevant to the discipline of sociology.
5. Students will demonstrate the ability to present their work as a cohesive artifact to their relevant publics.

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE General

In addition to the general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements), the following requirements represent the minimum acceptable standards for admission.

Preference is given to students who have a substantial background in sociology, such as an undergraduate major or minor or 18 or more college-level credit hours in sociology. Students with an undergraduate or graduate degree in a closely related field will also receive consideration for admission.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the following requirements apply:

1. Credit hour requirements: Students in the M.S. in Sociology program are required to earn a minimum of 36 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: Students in the online digital sociology concentration area typically fulfill the M.S. program requirements through the completion of two three-credit practicum projects in SOCY 699. These projects should demonstrate their theoretical and methodological mastery of the subject area. Full-time students should take the practicum requirement during the fall and spring semesters of their second year in the program. The final product is a research project that contributes to the student's goals and meets the standards for publication in the sociology department's online journal. Practicum projects must relate to at least three of the four substantive areas in the concentration: professional digital practice, sociological analysis of digital use, digital data analysis and critical digital sociology.

Course	Title	Hours
Required core courses		
SOCY 502	Contemporary Sociological Theory	3
SOCY/STAT 508	Introduction to Social Statistics	3
SOCY 601	Sociological Research Methods	3
SOCY 602	Applications of Sociological Research Methods	3
SOCY 699	Seminar in Sociological Practice (course may be repeated; six credits required for degree)	6
Digital sociology concentration courses		
SOCY 525	Digital Social Problems	3
SOCY 616	Digital Sociology	3
SOCY 656	Social Network Analysis	3
SOCY 673	Public Sociology	3
SOCY 676	Digital Data for the Social Sciences	3
Elective (with approval of the graduate program director)		3
Total Hours		36

Total graduate credit hours required (minimum) 36

Graduate program director
Tara M. Stamm, Ph.D.
Email: tmstamm@vcu.edu
Phone: (804) 828-9432

Program website: sociology.vcu.edu (http://www.sociology.vcu.edu)

Sociology, Master of Science (M.S.), accelerated Bachelor of Science in Sociology (B.S.) to master's

The accelerated B.S. and M.S. program allows qualified students, with a major in sociology, to earn both degrees in a minimum of five years by completing approved graduate courses during the senior year of the undergraduate program. The program will provide students with the opportunity to expand and deepen their knowledge of sociology, enhance their credentials for the job market, and/or prepare for further professional education. Students in the program may count up to 12 hours of graduate courses toward both the B.S. and M.S. degrees. Thus, the two degrees may be earned with a minimum of 144 hours instead of the 156 required if the degrees are pursued separately.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

The program is restricted to students who have demonstrated a clear interest in sociology. Minimum qualifications for admittance to the program include completion of 90 undergraduate credit hours with an overall GPA of 3.0, and a minimum of nine credit hours in sociology with a GPA of 3.3. Prior to being formally considered for admittance and before enrolling in graduate courses, the student must complete the graduate school application, submit GRE general aptitude scores and supply supporting information required for admission. All persons admitted to the program must meet the graduate student standards of performance, e.g., maintain a 3.0 GPA, and satisfactorily complete all requirements for the degree.

The director of graduate studies will provide guidance to students in this program. Students who are interested in this program should consult with the director of graduate studies or the director of undergraduate studies before they have completed 90 credits. Both directors may be contacted for more information about admission procedures.

Requirements for the Bachelor of Science in Sociology include the completion of a minimum of 120 credits. Students in the accelerated program may take up to six graduate sociology credits in each of the final two semesters of their undergraduate course work. These courses

are shared credits with the graduate program, meaning that they will be applied to both undergraduate and graduate degree requirements. A maximum of 12 graduate credits may be taken prior to completion of the baccalaureate degree.

The B.S. degree will be awarded when the student has completed all requirements for the undergraduate degree, which may include the 12 graduate sociology credits. The graduate sociology courses that may be taken, once a student is admitted to the program, include:

Course	Title	Hours
SOCY 502	Contemporary Sociological Theory	3
SOCY/STAT 508	Introduction to Social Statistics	3
SOCY 601	Sociological Research Methods	3
SOCY/STAT 608	Statistics for Social Research	3
Other SOCY graduate courses, with the approval of the director of graduate studies		

Such courses may serve as an elective requirement for the M.S. degree and an elective for the undergraduate major. All accelerated program students must have their schedules approved by the director of graduate studies prior to registration.

Graduate program director
Julie A. Honnold, Ph.D.
Email: jhonn@vcu.edu
Phone: (804) 828-6680

Additional contact
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Lead adviser
Email: bobbittrs@vcu.edu
Phone: (804) 828-8847

Program website: sociology.vcu.edu (http://www.sociology.vcu.edu)

Department of Statistical Sciences and Operations Research

D'Arcy P. Mays III, Ph.D.
Associate professor and chair

ssor.vcu.edu (https://ssor.vcu.edu)

The Department of Statistical Sciences and Operations Research offers programs leading to a Bachelor of Science in Mathematical Sciences, a Master of Science in Mathematical Sciences with a concentration in either operations research or statistics and a Doctor of Philosophy in Systems Modeling and Analysis. The curriculum of the programs is run jointly with the Department of Mathematics and Applied Mathematics (http://bulletin.vcu.edu/undergraduate/college-humanities-sciences/departmentofmathematicsandappliedmathematics).

The department also offers a post-baccalaureate undergraduate certificate in statistics.

- Mathematical Sciences, Master of Science (M.S.) with a concentration in operations research (p. 317)
- Mathematical Sciences, Master of Science (M.S.) with a concentration in statistics
- Systems Modeling and Analysis, Doctor of Philosophy (Ph.D.) (p. 290)

Mathematical Sciences, Master of Science (M.S.) with a concentration in operations research

Program goal

The Department of Mathematics and Applied Mathematics and the Department of Statistical Sciences and Operations Research jointly offer the M.S. in Mathematical Sciences.

The mission of the Department of Statistical Sciences and Operations Research is to offer a strong undergraduate and graduate education, with an increasing focus on the development of cross-disciplinary efforts that will prepare students for real-world applications and stimulating employment and career opportunities.

The program offers maximum flexibility by allowing students, in consultation with their graduate committees, to design a course of study that will best develop competence in those areas most relevant to their scholarly and professional objectives. Students may obtain a designation on their transcripts indicating that their graduate study has emphasized the mathematics concentration by completing the requirements that are listed here. A student who has not satisfied the requirements for one of the program concentrations offered, but who has otherwise fulfilled all the requirements for a master's degree, will be awarded a degree of Master of Science in Mathematical Sciences without any specialization.

Student learning outcomes

1. Students will demonstrate a comprehensive understanding of basic mathematical programming methods, stochastic models and decision analysis.
2. Student will be able to obtain, analyze and interpret the data necessary to perform operations research projects.
3. Students will be able to solve a wide variety of operations research problems using the software commonly used in industry.
4. Students will know how to clearly and concisely present technical information in writing and through oral presentations.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 1	GRE-General
	Spring	Oct 1	TOEFL (International students only)

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Thirty credit hours in undergraduate mathematical sciences, computer science or related areas of which at least 18 credit hours must represent upper-level courses
2. Three letters of recommendation pertaining to the student's potential ability as a graduate student in mathematical sciences

Provisional admission may be granted when deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are remedial or designed to remove deficiencies will not be accepted for credit hours toward the fulfillment of the course requirements for the master's degree.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to meet the following requirements.

1. Credit hour requirements: Students in the M.S. in Mathematical Sciences program are required to earn a minimum of 30 graduate-level credit hours. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: All students must pass two comprehensive examinations: foundations of operations research, covering OPER 527 and OPER 528 and methods of operations research, covering OPER 639, OPER 643 and STAT 613. All students will be given two attempts to pass each exam. Students who receive a minimum grade of B on both OPER 527 and OPER 528 and a grade of A on at least one of the two courses will not need to take the foundations of operations research exam. Students who receive a minimum grade of B on each of OPER 639, OPER 643 and STAT 613 and a grade of A on at least one of the three courses will not need to take the methods of operations research exam.

Curriculum requirements

Course	Title	Hours
Concentration core courses		
OPER 527	Optimization I [1]	3
OPER 528	Stochastic Simulation [1]	3
OPER 639	Practical Optimization	3
OPER 643	Decision and Risk Analysis	3
OPER 690	Research and Communications Seminar	3
STAT 613	Stochastic Processes	3
Additional courses		
Operations research electives (Choose courses from list one below)		6
Operations research and allied field electives (Choose courses from list two below)		6
Total Hours		30

[1]

If a student previously received credit hours for OPER 527 and/or OPER 528 or their equivalents, then one or two other operations research courses must be taken in their place.

Total graduate credit hours required (minimum) 30

List one: Recommended electives in operations research

Course	Title	Hours
OPER 627	Optimization II	3
OPER 635	Network Models and Graph Theory	3
OPER/STAT 636	Machine Learning Algorithms	3
OPER 641	Stochastic Simulation and Monte Carlo Methods	3
OPER 645	Queuing Theory	3
OPER 647	Multiobjective Decision Analysis	3
OPER 648	Systems Reliability Analysis	3
OPER 649	Statistical Quality Control	3
OPER 691	Special Topics in Operations Research	1-3

OPER 696	Applied Project	1-3
OPER 697	Directed Research	1-3
OPER 698	Thesis	1-3
OPER 731	Discrete Optimization	3
OPER 732	Optimization Under Uncertainty	3
OPER/STAT 736	Mathematics of Knowledge and Search Engines	3
OPER 741	Advanced Stochastic Simulation	3
OPER 743	Decision Analysis II	3
OPER 791	Special Topics in Operations Research	1-3

List two: Recommended electives in operations research and allied fields

Course	Title	Hours
Any 500-, 600- or 700-level MATH, OPER or STAT course except the following		
MATH 505	Modern Geometry	
MATH 593	Internship in Mathematical Sciences	
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	
MATH 698	Thesis	
STAT 508	Introduction to Social Statistics	
STAT 543	Statistical Methods I	
STAT 608	Statistics for Social Research	
STAT 696	Applied Project	
STAT 698	Thesis	

Graduate program director
David J. Edwards, Ph.D.
Associate professor, Department of Statistical Sciences and Operations Research
dedwards7@vcu.edu
(804) 828-2936

Additional contact
QiQi Lu, Ph.D.
Graduate admissions
qlu2@vcu.edu
(804) 828-1304

Program website: ssor.vcu.edu (http://ssor.vcu.edu)

Mathematical Sciences, Master of Science (M.S.) with a concentration in statistics

Program goal

The Department of Mathematics and Applied Mathematics and the Department of Statistical Sciences and Operations Research jointly offer the M.S. in Mathematical Sciences.

The mission of the Department of Statistical Sciences and Operations Research is to offer a strong undergraduate and graduate education, with an increasing focus on the development of cross-disciplinary efforts that will prepare students for real-world applications and stimulating employment and career opportunities.

The program offers maximum flexibility by allowing students, in consultation with their graduate committees, to design a course of study that will best develop competence in those areas most relevant to their scholarly and professional objectives. Students may obtain a designation on their transcripts indicating that their graduate study has emphasized the mathematics concentration by completing the requirements that are listed here. A student who has not satisfied the requirements for one of the program concentrations offered, but who has otherwise fulfilled all the requirements for a master's degree, will be awarded a degree of Master of Science in Mathematical Sciences without any specialization.

Student learning outcomes

1. Students will demonstrate a comprehensive understanding of basic statistical concepts, probability and inference, general linear modeling, calculus, and linear algebra.
2. Students will know how to select appropriate samples and conduct appropriate experimental data collection methods.
3. Students will be able to perform appropriate analysis of data, including knowledge of the assumptions associated with the procedures and how to determine the appropriate procedure to use.
4. Students will be able to use statistical software packages to solve various problems.
5. Students will know how to clearly and concisely present technical information in writing and through oral presentations.

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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
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Provisional admission may be granted when deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are remedial or designed to remove deficiencies will not be accepted for credit hours toward the fulfillment of the course requirements for the master's degree.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to meet the following requirements.

1. Credit hour requirements: Students in the M.S. in Mathematical Sciences program are required to earn a minimum of 30 graduate-level credit hours. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: All students must pass two comprehensive examinations: statistical theory (covering STAT 513 and STAT 514) and statistical application (covering STAT 546, STAT 642 and STAT 643). All students will be given two attempts to pass each exam.

Curriculum requirements

Course	Title	Hours
Concentration core courses		
SSOR 690	Research and Communications Seminar	3
STAT/BIOS 513	Mathematical Statistics I [1]	3
STAT/BIOS 514	Mathematical Statistics II [1]	3
STAT 546	Linear Models	3
STAT 642	Design and Analysis of Experiments I	3
STAT 643	Applied Linear Regression	3
Additional courses		
Statistics electives (Choose courses from list one below.)		6
Statistics and allied fields electives (Choose courses from list two below.)		6
Total Hours		30

[1] If student previously received credit for STAT 513/BIOS 513 and/or STAT 514/BIOS 514 or their equivalents, then one or two other statistics courses must be taken in their place.

Total graduate credit hours required (minimum) 30

List one: recommended electives in statistics

Course	Title	Hours
500-, 600- or 700-level STAT courses, except the following:		
STAT 508	Introduction to Social Statistics	
STAT 543	Statistical Methods I	
STAT 544	Statistical Methods II	
STAT 608	Statistics for Social Research	

List two: recommended electives in statistics and allied fields

Course	Title	Hours
500-, 600- or 700-level MATH, OPER, STAT or SYSM courses, except the following:		
MATH 661	Number and Operations	
MATH 662	Geometry and Measurement	
MATH 663	Functions and Algebra	
MATH 664	Statistics and Probability	
MATH 665	Rational Numbers and Proportional Reasoning	
MATH 667	Functions and Algebra II	
MATH 690	Research Seminar	
MATH 697	Directed Research	
MATH 698	Thesis	
OPER 696	Applied Project	
OPER 697	Directed Research	
OPER 698	Thesis	
STAT 508	Introduction to Social Statistics	
STAT 543	Statistical Methods I	
STAT 544	Statistical Methods II	
STAT 608	Statistics for Social Research	

SYSM 681	Systems Seminar I
SYSM 682	Systems Seminar II
SYSM 683	Systems Seminar III

Graduate program director
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Additional contact
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Graduate admissions
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(804) 828-1304

Program website: ssor.vcu.edu (http://ssor.vcu.edu)

Systems Modeling and Analysis, Doctor of Philosophy (Ph.D.) [Department of Statistical Sciences and Operations Research]

Program goal

The Ph.D. in Systems Modeling and Analysis is offered jointly by the Department of Statistical Sciences and Operations Research and the Department of Mathematics and Applied Mathematics. The program focuses on the development of the mathematical and computational skills used to conceptualize and analyze real-world systems. Faculty and students will engage and collaborate to contribute to the knowledge base used in the fields of science, medicine, business and engineering. The continued development of applied mathematics, discrete mathematics, operations research and statistics is critical to scientific advancement in the 21st century. The curriculum enables students to expand the frontiers of knowledge through original, relevant research involving quantitative and qualitative complex systems derived from real, contemporary problems facing our world.

Student learning outcomes

1. Gain a solid foundation in the theory and application of optimization, stochastic processes, simulation, decision analysis and biomathematics, and demonstrate a comprehensive understanding of these concepts
2. Learn to perform appropriate collection, modeling and analysis of data using statistical methods
3. Demonstrate the ability to identify situations in which mathematics, operations research or statistics can be applied and model the situation
4. Demonstrate the ability to solve a wide variety of mathematics, operations research or statistics problems using the software commonly used in industry
5. Demonstrate the ability to write code using appropriate research programming environments to implement research ideas
6. Learn how to interpret the analysis from mathematics, operations research or statistics models to draw meaningful conclusions about the systems being studied
7. Gain the ability to successfully communicate research ideas through writing and presentations
8. Gain the skills needed to successfully participate in research under the guidance of faculty

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Feb 1	GRE-General
	Spring	Nov 1	
	Summer	Jul 1	

Note: Assistantships are only available starting in the fall semester. Spring and summer semester admission deadlines are only for students not seeking an assistantship.

In addition to general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission: have completed an undergraduate degree with at least 30 credit hours of undergraduate-level mathematics, including calculus I and II, multivariate calculus, linear algebra, probability and statistics. Applicants also must have completed at least one upper-level mathematics class that includes mathematical reasoning, such as abstract algebra, combinatorics, graph theory, real analysis or topology.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the systems modeling and analysis Ph.D. program are required to earn a minimum of 57 graduate-level credit hours beyond the baccalaureate. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Qualifying exam: Students must pass a qualifying exam covering material from each of the first three core courses they take after admission to the program. Two attempts are allowed for each exam. This requirement must be fulfilled by the end of the semester following completion of 18 graduate credit hours. Students are exempt from a qualifying exam if they earned an A in the corresponding core course or if they took an equivalent course at another university, as determined by the Ph.D. steering committee.
3. Doctoral candidacy: Admission to candidacy is made by evaluation of a qualifying portfolio, including exams and project work from courses; writing samples from the research seminars (SYSM 681, SYSM 682 and SYSM 683); research products from systems research projects (SYSM 697); and statements from faculty advisers and instructors. The portfolio can be submitted after all course work has been completed, as well as any additional preparatory course work required at admission. The candidacy committee will evaluate the student's readiness to begin their dissertation work. Supplementary examination may be required by the committee.
4. Dissertation proposal: After admission to candidacy and the completion of all course work, the student will prepare a written and oral proposal of the intended dissertation research area, including a complete literature review. A successful proposal must be completed at least nine months prior to the dissertation defense.
5. Dissertation defense: The student must complete 18 credit hours in SYSM 798 resulting in a publishable dissertation and a successful oral defense. The student also must have submitted at least one paper to a refereed academic journal and prepared a second manuscript or given a conference presentation on the research prior to the defense.

Curriculum requirements

Course	Title	Hours
Choose three from the following foundation courses:		9
MATH 535	Introduction to Dynamical Systems	
MATH 556	Graph Theory	
OPER 527	Optimization I	
STAT 513	Mathematical Statistics I	
SYSM 681	Systems Seminar I	1
SYSM 682	Systems Seminar II	1
SYSM 683	Systems Seminar III	1
SYSM 697	Systems Research [1]	3
SYSM 798	Dissertation Research	18
Electives (Choose courses from lists below.) [2]		24
Total Hours		57

[1] Students are required to take SYSM 697 with a faculty adviser before admission to candidacy.

[2] Students must complete at least nine credit hours at the 700-level and must complete courses in at least two of the following subject areas: discrete mathematics, mathematical biology, operations research and statistics from the lists below. Electives will be determined based on a student's research interests and in consultation with their advisers and the graduate program director.

Total graduate credit hours required (minimum) 57

Elective courses in discrete mathematics

Course	Title	Hours
MATH 750	Topics in Combinatorics: ____	3
MATH 756	Topics in Graph Theory: ____	3

Elective courses in mathematical biology

Course	Title	Hours
MATH 715	Numerical Solutions for Differential Equations	3
MATH 732	Ordinary Differential Equations II	3
MATH 769	Topics in Applied Mathematics: ____	3
SYSM 780	Stochastic Methods in Mathematical Biology	3

Elective courses in operations research

Course	Title	Hours
OPER 731	Discrete Optimization	3
OPER 732	Optimization Under Uncertainty	3
OPER/STAT 736	Mathematics of Knowledge and Search Engines	3
OPER 741	Advanced Stochastic Simulation	3
OPER 743	Decision Analysis II	3
OPER 791	Special Topics in Operations Research	1-3

Elective courses in statistics

Course	Title	Hours
STAT 725	Advanced Multivariate Statistical Methods	3
STAT/OPER 736	Mathematics of Knowledge and Search Engines	3
STAT 742	Design and Analysis of Experiments II	3
STAT 744	Regression II	3
STAT 745	Advanced Bayesian Statistics	3
STAT 746	Spatial Data Analysis	3
STAT 791	Special Topics in Statistics	1-3
SYSM 780	Stochastic Methods in Mathematical Biology	3

Other electives

Course	Title	Hours
500-, 600- or 700-level MATH, OPER, STAT or SYSM courses except the following:		
MATH 505	Modern Geometry	3
MATH 593	Internship in Mathematical Sciences	3,6
MATH 661	Number and Operations	3
MATH 662	Geometry and Measurement	3
MATH 663	Functions and Algebra	3
MATH 664	Statistics and Probability	3
MATH 665	Rational Numbers and Proportional Reasoning	3
MATH 667	Functions and Algebra II	3
MATH 690	Research Seminar	2
OPER 696	Applied Project	1-3
MATH 698	Thesis	1-3
OPER 698	Thesis	1-3
STAT 508	Introduction to Social Statistics	3
STAT 543	Statistical Methods I	3
STAT 608	Statistics for Social Research	3
STAT 696	Applied Project	1-3
STAT 698	Thesis	1-3

Graduate program director
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Program website: sysm.vcu.edu (http://sysm.vcu.edu)

SCHOOL OF THE ARTS

The School of the Arts offers 25 degree programs and comprises more than 3,000 students. With the inclusion of our campus in Qatar come an additional four programs. It all began as one night class taught by Theresa Pollak in the fall of 1928.

The school strives to be a stimulating community of students and teachers who cross the boundaries of conventional art and design disciplines, apply aesthetic and intellectual vision to the expression of complex ideas, value artistic tradition and experimentation in the search for creative solutions, connect international experience with professional education, integrate technical skills with theoretical understanding and care about the impact of their work on people.

Administration

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Associate dean for curriculum and assessment

Margaret Lindauer
Interim director for graduate studies

David Ross
Special assistant to the dean

Nancy M. Scott
Associate dean for academic administration

Jody Symula
Assistant dean for student affairs

Accreditation

VCU is accredited by the National Association of Schools of Art and Design, the National Association of Schools of Dance, the National Association of Schools of Music and the National Association of Schools of Theatre.

Visual arts

Visual arts degree programs

Art education, art history, cinema, communication arts, craft and material studies, fashion (design and fashion merchandising), graphic design, interior design, kinetic imaging, painting and printmaking, and sculpture

National Association of Schools of Art and Design

Art education (bachelor's and master's degrees)

National Association of Schools of Art and Design, National Council for Accreditation for Teacher Education, Virginia Department of Education

Interior design (bachelor's degree)

National Association of Schools of Art and Design, Council for Interior Design Accreditation

Performing arts

Dance and choreography (bachelor's degree)

National Association of Schools of Dance

Music (bachelor's and master's degrees)

National Association of Schools of Music

• Music education concentrations (bachelor's and master's degrees) National Council for Accreditation National Association of Schools of Music, for Teacher Education, Virginia Department of Education

Theatre (bachelor's and master's degrees)

Programs

The School of the Arts offers degrees in the following areas of study:

Advanced Media Production Technology

- Post-baccalaureate undergraduate certificate

Art Education

- Master of Art Education

Art History

- Bachelor of Arts
- Master of Arts
- Doctor of Philosophy

Arts

- Bachelor of Fine Arts with a concentration in art education

Cinema

- Bachelor of Arts

Communication Arts

- Bachelor of Fine Arts

Craft and Material Studies

- Bachelor of Fine Arts
- See Fine Arts concentrations for master's option

Dance and Choreography

- Bachelor of Fine Arts

Design

- Master of Fine Arts (with concentrations in interior environments and visual communications)

Fashion

- Bachelor of Arts
- Bachelor of Fine Arts

Fine Arts

- Master of Fine Arts (with concentrations in ceramics, fibers, furniture design, glassworking and jewelry/metalworking; kinetic imaging; painting or printmaking; photography and film; sculpture)

Graphic Design

- Bachelor of Fine Arts

Interior Design

- Bachelor of Fine Arts

Kinetic Imaging

- Bachelor of Fine Arts
- See Fine Arts concentrations for master's option

Music

- Bachelor of Arts
- Bachelor of Music
- Master of Music

Painting and Printmaking

- Bachelor of Fine Arts
- See Fine Arts concentrations for master's option

Photography and Film

- Bachelor of Fine Arts
- See Fine Arts concentrations for master's option

Sculpture

- Bachelor of Fine Arts
- See Fine Arts concentrations for master's option

Theatre

- Bachelor of Arts
- Bachelor of Fine Arts
- Master of Fine Arts

School of the Arts Visual Resource Center

VCU's Cabell Library houses an extensive collection of books, publications and magazines on the visual and performing arts. VCU subscribes to ARTstor, the largest online image bank for the arts.

VCU is a short distance from Washington, D.C., Baltimore, Philadelphia and New York and the museums, libraries and research facilities in those urban areas.

Graduate information

Graduate admission

Admission procedures

Application forms and instructions for applying to all graduate programs in the School of the Arts are available on the School of the Arts website at arts.vcu.edu (http://arts.vcu.edu).

General information about admission to graduate study and application procedures can be found in the Graduate School section of this bulletin or on the Graduate School website (http://www.graduate.vcu.edu).

Admission requirements

For Ph.D. degree, see Ph.D. in Art History section.

For all other degrees (M.A., M.A.E., M.F.A. and M.M.):

- Applicants should hold the baccalaureate degree from an accredited institution.
- It is expected that applicants will have a 3.0 (B) average on the last 60 semester hours of undergraduate work.

The prospective student should consult the appropriate section of this bulletin for additional admission requirements for a particular degree program. Such requirements include:

- The Graduate Record Examination for applicants to art history
- An audition and examination for music applicants, as described in the program description for the M.M. degree
- An audition or presentation of portfolio, as well as a personal interview, for applicants for the M.F.A. in Theatre
- A portfolio review for all applicants to the visual arts M.F.A. degrees (a personal interview is encouraged)

Graduate student status

The School of the Arts has two categories of graduate students — full-time or part-time. Full- or part-time graduate students are accepted either provisionally or as students with full standing into the graduate degree programs of the various departmental areas. These students may matriculate full time or part time except for the residence limitation discussed elsewhere in this bulletin.

Most graduate programs in the school require full-time status, including the concentrations in the Master of Fine Arts in Fine Arts degree (photography and film, painting and printmaking, sculpture, kinetic imaging, and ceramics, fibers, furniture design, glassworking and jewelry/metalworking) and the visual communication track of the M.F.A. in Design. Check with the individual departments to confirm whether full-time status is required or part-time status is permitted.

Holders of the baccalaureate degree from recognized institutions may enroll in graduate courses as nondegree-seeking (special) graduate students, but such courses are not applicable toward a graduate degree from this institution unless the student is accepted into a graduate degree program prior to the conclusion of the semester in which the student registered as a nondegree-seeking graduate student.

A nondegree-seeking student who is later admitted as a degree-seeking student will not be allowed to apply more than six credits earned as a nondegree-seeking student toward a degree.

The second type of nondegree-seeking graduate student is the student who holds a baccalaureate degree, who wishes to take graduate courses for personal enrichment and who does not intend to work toward a graduate degree. There is no limit to the number of credits that students in this category may take, as long as the academic performance is credible.

All nondegree-seeking (special) graduate students must have written permission from the chair of the appropriate department in order to enroll in classes.

Registration for graduate students

Graduate art students are urged to plan their schedules and register during advanced registration. Registration materials for students accepted into advanced degree programs are available in the department during the advanced registration and registration periods. The advantage of advanced registration is that of securing places in classes before they are closed and of obtaining proper counsel from advisers. All graduate students must see their assigned advisers for schedule planning and signature approval. New nondegree-seeking graduate students, or those contemplating registration as such, must secure written permission to register from the departmental chair.

Continuous enrollment policy for graduate students

Graduate students in the School of the Arts must observe the university's continuous enrollment policy (p. 29) as explained elsewhere in this bulletin.

Candidates for all advanced degree programs, after completing all formal course work, must register for at least one semester hour of credit each semester, except summer, until the culminating graduate project (dissertation, thesis, creative project, exhibition, recital, etc.) is completed and the student is ready to graduate. Also, if candidates intend to graduate in August, they must be enrolled for at least one semester hour in the summer session.

Transfer credit and graduate study

A maximum of nine graduate credits may be transferred from other accredited institutions and applied to any of the graduate degree programs in the School of the Arts. However, transfer credit is not typically granted to incoming students and is approved at the discretion of the department chair.

Graduate advising

All students accepted into advanced degree programs must make an appointment with the chair of the department or the graduate adviser prior to registration for their first semester of course work. Normally, the student's initial adviser will be the chair of the department; but students may be assigned an adviser more directly related to their areas of concentration.

Students also are encouraged to consult faculty members outside their major area and arrange with the appropriate departmental chair to use facilities and equipment available in other departments.

Finances for graduate students

Special charges

All degree-seeking graduate students are charged an art comprehensive fee. The art comprehensive fee is not charged to students who are registered only in course work to complete a dissertation/thesis/creative project or who are enrolled in order to satisfy the one-credit requirement for continuous enrollment. Nondegree-seeking graduate students enrolled in any of the courses that require an additional outlay for materials will be billed for those individual fees by the Student Accounting Department.

In addition to the comprehensive fee for all majors in the School of the Arts, all students registering for private music lessons pay an applied music fee.

Financial support

The School of the Arts awards a limited number of graduate assistantships and scholarships to full-time students. Please see the specific program requirements for more information and application deadlines.

Advanced degree candidacy

Students seeking an advanced degree in all programs must apply for advanced degree candidacy. Those seeking the M.A.E. and the M.M. must submit the application during or after the completion of the first nine semester credits of graduate work and prior to the completion of 18 semester credits. Students pursuing the M.F.A. degree must submit the application during or after the completion of the first 15 semester credits of graduate work and prior to the completion of 30 semester credits. Applications for candidacy are available in the departmental offices and the Office of Graduate Studies of the School of the Arts.

Admission to a degree program does not constitute candidacy, and admission to degree candidacy is not an automatic process. Departments carefully review applicants for candidacy on such basis as examination or review of creative work or performance. Upon certification by the department that the applicant has met all departmental expectations, including the minimum 3.0 GPA and is adequately prepared to continue pursuing the degree program, the School of the Arts will admit the applicant to degree candidacy.

Students who are found to be inadequately prepared to continue their graduate programs, but who demonstrate the potential to ultimately fulfill degree requirements will be advised as to what additional work will be needed in order to meet departmental expectations. Candidacy, in such instances, will be postponed until departmental expectations are satisfied; postponement of candidacy may result in termination of financial assistance. Students whose academic or creative work demonstrates no likelihood of successful completion of a graduate program will be denied candidacy by the School of the Arts.

Advanced degree requirements

- Students must achieve candidacy (with the exception of art history students).
- Students must complete all formal course work.
- Students must maintain a minimum 3.0 cumulative GPA. No grade below B will count toward graduation for students in the art history and the visual communications degree programs. For all students in the theatre program, any grade below B in any course will result in termination from the degree program. Students in all programs in the Department of Music must not have more than six hours or 20 percent of semester hours attempted — whichever is greater — with a grade of C. For all other degree programs in the School of the Arts, no grade below B is acceptable for any course within the student's major

department, and a grade below B in a course in the student's major department will result in termination from the degree program.

- All students must complete the culminating project (dissertation, thesis, final examination, creative project, recital, etc.) as outlined in departmental guidelines. The thesis, or other written documentation related to the culminating project, must be done in a form that can be retained by the university and in accordance with departmental guidelines. Students preparing a thesis must use the guidelines set forth in the "Preparation of Thesis," available in departmental offices or the Office of Graduate Studies, School of the Arts.

Residency requirements for graduate study

Candidates for the Master of Fine Arts degree in the fine arts and theatre must complete a minimum of one-third of their degree program semester-hour credits within one calendar year.

Candidates for all master's degrees in the School of the Arts have five years plus two possible extensions of one year each to complete all degree requirements. The above limitations apply to both full-time and part-time students. A petition for an extension is initiated with the academic or thesis adviser.

Media, Art, and Text, Doctor of Philosophy (Ph.D.) [School of the Arts]

Program goal

VCU's interdisciplinary doctoral program in media, art, and text is a joint endeavor of the Department of English, the School of the Arts and the Richard T. Robertson School of Media and Culture. The program prepares students primarily to teach at the college or university level, although some pursue careers in related media fields. MATX emphasizes the historical and theoretical foundations essential to the scholarly study of media, both old and new, broadly defined. It provides an intellectually stimulating environment that encourages students to work both collaboratively and independently, as well as across and between disciplines and media. Students maintain a base in their primary area of research, which is usually but not always the field in which they have done prior graduate work.

Student learning outcomes

1. Develop advanced communication skills in writing, speaking and the use of multimedia
2. Demonstrate broad knowledge of history and theory as the foundation for interdisciplinary work in a specialized facet of media, art, and/or text
3. Develop competence in interdisciplinary and disciplinary research methods and responsible conduct of research
4. Develop specialized knowledge in relevant fields to support dissertation and subsequent research
5. Demonstrate the ability to conduct independent research and produce new, specialized knowledge within the broad parameters of media, art, and text
6. Develop a strong basis for ongoing professional practice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

The MATX student handbook is available at **matx.vcu.edu/program/handbook**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 2	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission.

1. Applicants must hold a master's degree (M.A., M.F.A., M.S.) in a relevant field.
2. Applicants must submit the following, in the formats indicated via VCU's online application portal..
   a. Writing sample demonstrating the ability to write clearly, analyze effectively and conduct original research in advanced doctoral-level seminars – This may be a master's thesis, a graduate-level seminar paper or a published essay. Submit as a PDF.
   b. Statement of purpose describing the applicant's interest, motivation and goals in pursuing this degree – The statement should specifically address the importance of interdisciplinarity to the applicant's academic goals, and it should also offer evidence of preparation for the study of media, art, and text. The applicant should indicate the specific area of study and research to be pursued at VCU and identify faculty who might potentially direct dissertation research. Submit as a PDF.
   c. Academic curriculum vitae or professional resume – List all colleges and universities attended and degrees earned, all professional and academic positions held, all publications and/or exhibitions, technical skills, and any other relevant information. Include URLs for personal and/or professional websites. Submit as PDF.
   d. Letters of recommendation – Provide letters from three present or former instructors or other individuals qualified to evaluate the applicant's ability to engage in interdisciplinary study at the doctoral level. Have recommenders submit their letters via the online application portal.
3. Applicants who wish to pursue creative work at VCU must also submit a portfolio. Those with an M.F.A. who do not wish to continue creative work should consult with the MATX director about this requirement. Materials submitted should demonstrate excellence in studio or professional practice and the potential to do graduate-level work in media, art, and text. Portfolios will be reviewed by the MATX admissions committee as well as relevant faculty in the School of the Arts and the Richard T. Robertson School of Media and Culture. Please observe the following guidelines:
   a. Those working in 2-D or 3-D mediums should provide 20 images of representative work arranged chronologically, beginning with the most recent.
   b. Those working in sound and time-based media, as well as those in the performing arts, should provide clips totaling no more than 10 minutes.
   c. Those working across media may submit a combination of the above.
   d. The portfolio should include title, date, media and dimensions of each work, as well as a brief statement or other information that will help the admissions committee in its evaluation.

      Small files illustrating 2-D or 3-D work should be submitted in a single PDF. Sound or video files should be posted to Vimeo or Sound Cloud with a functioning link submitted in a PDF with the required information posted to the portal. Portfolio materials may also be posted to a personal or professional website and the link submitted in a PDF posted to the portal.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the MATX program are required to earn a minimum of 42 graduate-level credit hours beyond the master's. At least one-half of the credit hours presented for graduation must be at the 600 level or higher. The 42-hour curriculum comprises 36 hours of course work and a minimum of six hours of dissertation research. Course work includes a core of four required courses taken during the first two semesters by all incoming students. Three doctoral seminars provide a shared historical and theoretical foundation for the study of media, art, and text, while a workshop offers the opportunity to develop and expand professional and/or creative skills relevant to the student's career goals and research focus. In addition, all students will take a research methods course in a field relevant to their anticipated area of dissertation research. Beyond the core, students select 21 hours of elective credit hours from course offerings in disciplines relevant to their research interests and career goals. The program offers a topics seminar focused on the history, theory or practice of media, art, and text. Independent study and internships are also available as electives. While enrollment in courses with the MATX prefix is guaranteed to matriculated MATX students, enrollment in other graduate courses is subject to the conditions established by individual units. Together the core and the electives support the interdisciplinary work of the dissertation, which is an original scholarly examination of some aspect of media, art, and/or text. It may include work in media other than text. It is supervised by a committee consisting of four or five members drawn from disciplines relevant to the research topic.
2. Grade requirements: To graduate, degree applicants must achieve an overall grade point average of 3.0 (B) on a 4.0 scale with a grade of C in no more than two courses. The GPA for graduation will be based on all graduate courses attempted after acceptance into the program.
3. Requirements for admission to candidacy: Before beginning formal dissertation research, students must complete all 36 hours of required course work, both stages of the e-portfolio and the requirements described below. Upon completion of these, the student will apply for degree candidacy.
4. Dissertation committee: The dissertation committee consists of the director (who must hold a Ph.D.) and three or four additional members whose scholarly knowledge and interests are relevant to the project. The committee must have at least one member from each of the sponsoring units (Department of English, School of the Arts, Richard T. Robertson School of Media and Culture). All must be members of VCU's graduate faculty. Appropriate faculty from outside VCU may serve on committees (but not as director) with the approval of the MATX director and the graduate dean. It is the student's responsibility to assemble the committee, in consultation with the dissertation director. Committees will not be appointed by the program.
5. E-portfolio: Work on the e-portfolio will begin in MATX 604 in the spring of the first year. There are no technical specifications, and content will include, but is not limited to, work done in the first two years in the program. It will take the form of a website and must demonstrate the technical skills (Web design, audio, video, etc.)

relevant to the student's work on the dissertation and the career sought after VCU. Submission is a two-stage process:
   a. Stage 1 (August of the second year): a three- to five-page design rationale for the portfolio site along with a mock-up or rough structure
   b. Stage 2 (April of the second year): a finished, live site accompanied by a five-page statement relating it to the student's work inside and outside the program and outlining how it uses media techniques to promote a specific professional and/or creative identity (Note: Each submission is graded pass/fail and may be repeated once. A second failure results in automatic termination from the program.)
6. Competency: Candidates must demonstrate competency in a skill or technique relevant to the dissertation research or planned professional career. The dissertation committee approves and administers the competency portion. Graded pass/fail, the test may be repeated once.
7. Bibliography exam: Candidates will complete an exam on a reading list of 20 to 30 sources relevant to or supportive of the dissertation topic. The dissertation committee approves and administers the bibliography exam. Graded pass/fail, the test may be repeated once.
8. Dissertation prospectus and prospectus defense: The prospectus is a 15- to 20-page document that indicates the significance of the proposed research, gives a short review of relevant literature, states the research question, specifies the proposed methodology and indicates how the project lays the foundation for the anticipated academic or professional career. It also includes a work plan for the completion of research and writing, as well as a complete bibliography. The prospectus is defended orally before the dissertation committee, which may accept, reject or require revisions. The defense may be repeated once.
9. Dissertation and dissertation defense: The dissertation is an original, interdisciplinary and scholarly examination of a topic relevant to an aspect of media, art, and/or text. It may include work in media other than text. Given the varied nature of doctoral research, there is no set time frame for completion of a dissertation. It is expected, however, that the dissertation will take about two years after attaining candidacy, but it must be defended within the eight-year time limit for completion of the doctoral degree. The dissertation will be defended orally before the dissertation committee. Successful defense of the dissertation completes the requirements for the degree.

Curriculum requirements

Course	Title	Hours
MATX 601	Texts and Textuality	3
MATX 602	History of Media, Art, and Text	3
MATX 603	Mass Media	3
MATX 604	Interdisciplinary Workshop	3
MATX 897	Dissertation Project	6
Select one methods course from list 1 below		3
Select elective courses from list 2 below [1]		21
Total Hours		42

[1]

Elective courses other than those listed may be taken with approval of the MATX program director and the offering department.

Total graduate credit hours required (minimum) 42

List 1: Methods courses

Course	Title	Hours
ARTH 690	Historiography and Methodology of Art History	3
ENGL 605	Introduction to Scholarship in English Studies	3
GSWS 602	Feminist Research Epistemology and Methods	3
MASC 611	Research Methods in Mass Communications	3

List 2: Recommended electives

Course	Title	Hours
ARTH 591	Special Topics in Art History	1-6
ARTH 690	Historiography and Methodology of Art History	3
ARTH 722	Seminar in 19th-century Art	3
ARTH 723	Seminar in 20th-century Art	3
ARTH 741	Seminar in Art and Theory	3
ARTH 742	Seminar in Trans-millennial Art and Ideas	3
ARTH 743	Seminar in Art and Representation	3
ARTH 791	Special Topics in Art History	3
ENGL 560	Studies in British Literature and Culture	3
ENGL 570	Special Topics in American Literature and Culture	3
ENGL 605	Introduction to Scholarship in English Studies	3
ENGL 611	Authors	3
ENGL 614	Cultural Discourses	3
ENGL 620	Intertextuality	3
ENGL 624	Texts and Contexts	3
ENGL 627	Genres	3
ENGL 629	Form and Theory of Poetry	3
ENGL 630	Form and Theory of Fiction	3
ENGL 631	Form and Theory of Creative Nonfiction	3
ENGL 661	Themes in Interdisciplinary Studies	3
GSWS 501	Feminist Theory	3
GSWS 602	Feminist Research Epistemology and Methods	3
GSWS 620	Theorizing Sexuality	3
GSWS 624	Gender and Cultural Production	3
GSWS 691	Topics in Gender, Sexuality and Women's Studies	1-3
KINE 591	Topics in Contemporary Media	3
KINE 690	Graduate Seminar	4
KINE 695	Advanced Sound	3
MASC 611	Research Methods in Mass Communications	3
MASC 645	Visual Journalism	3
MASC 684	Multiplatform Storytelling	3
MASC 688	Converged Media Applications	3

MASC 691	Topics in Mass Communications	1-3
MATX 690	Seminar in Media, Art, and Text	3
MATX 696	Internship	1-3
MATX 791	Directed Study (may be taken for a maximum of 12 credit hours)	1-3

Graduate program director

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Additional contact
Thom Didato
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Program website: matx.vcu.edu (http://matx.vcu.edu)

Department of Art Education

Sara Wilson McKay, Ph.D.
Associate professor and chair

arts.vcu.edu/arteducation (http://arts.vcu.edu/arteducation)

The Department of Art Education supports instruction in art that encourages the construction of meaning. Faculty and students are actively involved with the art world, education and local and global communities through art-based service-learning, visual culture studies, critical thinking, exhibition, assessment, curriculum, critical theory and emerging digital technologies (virtual and interactive).

The department emphasizes interdisciplinary connections throughout the School of the Arts and the university as a whole. Through their own research and instruction, art teacher candidates engage their students and themselves in traditional and nontraditional forms of inquiry to contribute to the continuing growth and strength of the profession.

- Art Education, Master of (M.A.E.) (p. 330)

Art Education, Master of (M.A.E.)

Program accreditation
National Association of Schools of Art and Design
National Council for Accreditation of Teacher Education

Program goal

Through engagement with theory, research and emerging technologies, the Master of Art Education program prepares art educators to be mindful professionals who are active in the field of art education.

The program offers two specific options:

1. One option is for teachers who are already licensed and who wish to deepen their understanding of art education.
2. The second is for people who hold baccalaureate degrees and wish to earn a master's degree that may include a teaching license.

The program includes required and elective courses and allows students to pursue an area of interest. All students are expected to work at a high level of independence, be self-motivated, respect peers and instructors and participate in the opportunities that the Department of Art Education and the School of the Arts offer. With the assistance of the adviser, the student determines a viable structure for the content and sequence of a program of graduate study. Such a program can utilize the collective expertise of the art education faculty as well as appropriate community resources. Graduate course work, therefore, could include both on-campus and off-campus involvement.

Opportunities for personal growth through the M.A.E. program also include the rich resources of other graduate departments in the university in the visual and performing arts, education (including supervision, administration and specialty areas), the natural and social sciences and the humanities. Alternative approaches to traditional thesis methods are also encouraged within the program.

Student learning outcomes

1. **Theoretical foundations:** Students will demonstrate an ability to analyze varying points of view regarding art education theories.
2. **Research competencies:** Students will demonstrate the ability to apply research methods and methodologies to write a realistic proposal.
3. **Skills with and knowledge of emerging technologies:** Students will demonstrate knowledge of emerging technologies for teaching, research or art-making.
4. **Command of literature and practice in art education:** Students will demonstrate historical and current knowledge of theoretical and practical issues in art education.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.E.	Fall	Jan 15	GRE required if undergraduate GPA is below 3.2; optional if 3.2 or higher.

Special requirements

- See the School of the Arts admissions page for the specific directions about the portfolio,letters of reference, etc.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following requirements:

- Thirty-six undergraduate credit hours of art and art history course work (Students who do not have these credit hours from the undergraduate degree are welcome to take undergraduate courses to earn these credit hours before applying to VCU. These can be taken at any accredited undergraduate institution.)
- An undergraduate degree in art education, studio art, art history or a related field

It is desired, though not required, for students to have some teaching experience before applying.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.A.E. program requires a minimum of 36 graduate credit hours, including required art education and approved elective courses.

Licensure

For students who also pursuing teaching licensure, there are additional requirements, including:

Course	Title	Hours
EDUS 301	Human Development and Learning	3
ARTE 404	Clinical Internship Seminar	1
ARTE 550	Art for the Exceptional Learner	3
or SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
ARTE 501	Art Education Elementary Materials and Practicum	3
ARTE 502	Art Education Secondary Materials and Practicum	3
A semester of student teaching		

The electives in the following curricular requirements account for some of these courses. The M.A.E. plus licensure requires a minimum of 36 graduate credit hours plus 13-16 of undergraduate credit hours.

Students who wish to be considered for a teaching license are required to complete a series of tests as mandated by the Virginia Department of Education. See arts.vcu.edu/arteducation/mae/testing (http://arts.vcu.edu/arteducation/mae/testing) for additional information.

Written examination

After completing nine credit hours, including ARTE 611, and before completing 18 credit hours, all students are required to submit a written exam. This exam will determine whether a student is approved for degree candidacy and is ready to proceed to the final stages of the degree program. Failure to submit this required exam may result in dismissal from the program. Students who fail the exam will have a second chance the following semester. Students who fail on the second attempt will be dismissed from the program.

Thesis option

A thesis or project option may develop from graduate course work or professional involvement. Projects are those endeavors of thesis proportion that do not fit the traditional thesis format. A thesis or project may be explored by descriptive research, historical research, empirical/statistical research, design of learning packages, philosophical study, curriculum development, action research or other methodologies if deemed appropriate by the adviser and committee.

Comprehensive exam option

In lieu of the thesis, students complete six credit hours of graduate seminar work (ARTE 600 taken twice with different topics and different faculty members) in the Department of Art Education. In addition, students must successfully pass a written and oral comprehensive examination in the later stages of their course work. The examination will pertain to the course work, to contemporary issues in the field and to students' particular areas of expertise. This option is suggested for students pursuing the track that results in the M.A.E. and simultaneous teaching licensure.

Students who do not pass all portions of the comprehensive exam will have one opportunity to retake the exam the following semester. Students who fail the exam on the second attempt will be dismissed from the program and will not be eligible to graduate from the Department of Art Education.

Curriculum requirements

Thesis option

Course	Title	Hours
Core courses		
ARTE 611	Theory and Literature in Art Education (required first semester)	3
ARTE 665	Curriculum Development and Evaluation	3
ARTE 670	Technology in Art Education	3
ARTE 690	Issues and Methods of Inquiry in Art Education	3
Select one of the following:		3
ARTE 508	Two-dimensional Art Experiences	
ARTE 509	Three-dimensional Art Experiences	
ARTE 550	Art for the Exceptional Learner	
ARTE 600	Seminar: Issues in Art Education	
ARTE 691	Topics in Art Education	
ARTE 692	Independent Study in Art Education	
Approved electives		
Select approved electives at the 500 level or higher and approved by the adviser [1]		15
Thesis		
ARTE 799	Thesis	6
Total Hours		36

Total graduate credit hours required (minimum) 36

Comprehensive exam option

Course	Title	Hours
Core courses		
ARTE 611	Theory and Literature in Art Education (required first semester)	3
ARTE 665	Curriculum Development and Evaluation	3
ARTE 670	Technology in Art Education	3
ARTE 690	Issues and Methods of Inquiry in Art Education	3
Select one of the following:		3
ARTE 508	Two-dimensional Art Experiences	
ARTE 509	Three-dimensional Art Experiences	
ARTE 550	Art for the Exceptional Learner	
ARTE 600	Seminar: Issues in Art Education	
ARTE 691	Topics in Art Education	
ARTE 692	Independent Study in Art Education	
Approved electives		
Select approved electives at the 500 level or higher and approved by the adviser [1]		15
Seminar classes		
Take the following course twice: [2]		6
ARTE 600	Seminar: Issues in Art Education	
Total Hours		36

[1]

ARTE 691, ARTE 799, TEDU 672 and TEDU 674 may not count as approved electives.

[2]

Taken twice with different topics and different faculty members, after which students are required to take and pass the comprehensive exam.

Total graduate credit hours required (minimum) 36

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Program website: arts.vcu.edu/arteducation/mae (http://arts.vcu.edu/arteducation/mae)

Department of Art History

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Associate professor and chair

arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory)

The Department of Art History offers programs that acquaint students with the humanistic discipline of art historical inquiry. While providing students with the opportunity for a broad education drawing on the liberal arts and humanities, the department also emphasizes a close bond with the studio and performing arts and enjoys a close relationship with the other departments in the School of the Arts.

The department offers a broad-based education in the humanistic discipline of art history at the baccalaureate, master's and doctoral levels.

Overseas studies are available through university-sponsored programs abroad in Europe and Asia. Graduate assistantships and fellowships are available to full-time graduate students.

- Art History, Doctor of Philosophy (Ph.D.) with a concentration in curatorial (p. 332)
- Art History, Doctor of Philosophy (Ph.D.) with a concentration in historical studies (p. 335)
- Art History, Master of Arts (M.A.) with a concentration in historical studies (p. 336)
- Art History, Master of Arts (M.A.) with a concentration in museum studies (p. 338)

Art History, Doctor of Philosophy (Ph.D.) with a concentration in curatorial

Program goal

The Ph.D. in Art History is a research-oriented degree designed to train critical and productive scholars, college and university professors, and curators and museum professionals who are well-grounded in the literature, methodology and major art historical and/or museological problems in their selected areas of study.

All doctoral students establish a program of study that includes a major field of study and a minor field of study shared by a full-time faculty member. Students in the curatorial concentration select museum studies as either the major or minor field of study.

Student learning outcomes

1. Students apply critical and analytical concepts, frameworks and methods.
2. Students contextualize scholarship in relationship to existing art historical/museological knowledge, discourse and/or debate.
3. Students write effectively for audiences of scholarly and nonspecialist readers.
4. Students speak effectively to scholarly and nonspecialist audiences.
5. Students demonstrate ability to translate art historical scholarship written in a language or languages relevant to their research.
6. Students conduct scholarly inquiry that makes a scholarly professional contribution.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

For more information about the programs of study, go to arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory).

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall only	Jan 15	GRE

Special requirements

- Writing sample

Prospective students holding a master's degree in art history or a related field from VCU or any other accredited institution may apply directly to the doctoral program. Prospective students who hold only a bachelor's degree in art history or a related field also may apply directly to the Ph.D. program; if admitted, they select one of the three M.A. curriculum concentrations and complete 27 of the required 30 credit hours for the M.A. degree before beginning Ph.D. course work.

Applicants are encouraged to speak with a prospective dissertation adviser (the full-time faculty member whose research area corresponds to an applicant's interests).

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Ph.D. in Art History must meet the following requirements:

1. A statement of purpose, 750-1000 words in length, that briefly recounts applicant's academic background, describes an avenue of inquiry that the applicant expects to explore, notes applicant's professional goals beyond graduate study and explains why VCU's Ph.D. in Art History program is suited to applicant's interests
2. A research/writing sample that has a clearly articulated thesis statement, identifies and interprets primary and/or secondary sources in support of a well-argued thesis, and offers a coherent, cohesive narrative
3. Three letters of recommendation, at least two of which are from faculty members who can assess the applicant's preparation and promise for graduate work (Some applicants may choose to solicit the third letter from a museum professional who has supervised the applicant's professional work in a museum setting.)
4. Official transcripts from schools where applicant completed course work applied toward the baccalaureate or master's degree
5. An official report of GRE scores

Applications are reviewed by the program's full-time faculty members, who assess an applicant's overall package of materials with particular

attention to the statement of interest and writing sample. Applicants are encouraged to correspond with individual faculty members who share their areas of research interests.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the program of study for students who have an M.A. degree upon applying for the Ph.D. program is determined on a case-by-case basis, to include at least 30 credit hours in the concentration area. Students may also be required to also complete ARTH 690, ARTH 694 and/or selected art history seminars if they have not completed equivalent courses in their master's programs and/or if their degrees were awarded in fields other than art history. Students in the curatorial concentration may also be required to take one or more museum studies course (ARTH 681-ARTH 684, ARTH 691) if their M.A. programs did not include equivalent courses.

Students who matriculate into the concentration in historical studies with only a baccalaureate degree initially complete the requirements in either the concentration in historical studies or the concentration in architectural history in the M.A. program; they then proceed to complete the following 30 credit hours.

Major and minor art historical field of study

Students complete a major and a minor art historical field of study of their choosing. The major area requires three seminars, while the minor requires two seminars. M.A./Ph.D. students may complete some of these courses while at the master's stage.

Language proficiency

Doctoral students must demonstrate competency in two foreign languages relevant to their areas of research and approved by the departmental graduate committee before admission to candidacy. Foreign language competency demonstrated for an M.A. may be applied to this requirement. The Department of Art History administers language exams and offers a course in German for art history.

Admission to candidacy

Doctoral students are admitted to candidacy after demonstrating proficiency in two foreign languages, passing the major and minor field exams administered in ARTH 772 and ARTH 773 and orally defending a dissertation prospectus previously approved by the dissertation adviser. Only after candidacy is granted may a student enroll for dissertation credits.

Dissertation

After admission to candidacy, doctoral students proceed to complete and defend a dissertation. They work under the supervision of the dissertation director, and they are required to maintain continuous enrollment of at least three credit hours per semester (excluding summer) until they have attained six hours of dissertation credit, after which they may enroll for as few as one credit per semester. The dissertation must represent independent research that is devoted to an original question or hypothesis with the appropriate development, analysis and interpretation. Successful defense of the dissertation completes the requirements for the degree. All degree requirements must be completed within eight years of the first semester of enrollment in the doctoral program (either M.A./Ph.D. or Ph.D.).

Curriculum requirements

Course	Title	Hours
ARTH 693	Graduate Museum Internship	3
ARTH 772	Major Field Exam	3
ARTH 773	Minor Field Exam	3
ARTH 774	Dissertation Proposal	3
ARTH 899	Dissertation Research	6
Select three of the following art history or museum studies seminars:		9
ARTH 591	Special Topics in Art History	
ARTH 681	Museums and Communities	
ARTH 682	The Museum as Educational Institution	
ARTH 683	Museum Collections	
ARTH 684	Curating Museum Exhibitions	
ARTH 691	Special Topics in Museum Studies	
ARTH 694	Art History and Pedagogy	
ARTH 721	Seminar in Early Modern Art	
ARTH 722	Seminar in 19th-century Art	
ARTH 723	Seminar in 20th-century Art	
ARTH 725	Seminar in Pre-Columbian Art and Architecture	
ARTH 726	Seminar in African Art	
ARTH 727	Seminar in Latin American Art	
ARTH 728	Seminar in Asian Art	
ARTH 741	Seminar in Art and Theory	
ARTH 742	Seminar in Trans-millennial Art and Ideas	
ARTH 743	Seminar in Art and Representation	
ARTH 749	Seminar in Diasporic Art	
ARTH 791	Special Topics in Art History	
ARTH 797	Directed Research Project	
Select one of the following nonprofit management or research methods courses:		3
ARTE 690	Issues and Methods of Inquiry in Art Education	
EDUS 660	Research Methods in Education	
PADM 650	Principles of Nonprofit Management	
PADM 656	Fund Development for the Nonprofit Sector	
PADM 659	Financial Management for Nonprofit Organizations	
PADM 661	Nonprofit Law, Governance and Ethics	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Margaret A. Lindauer, Ph.D.
Associate professor
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Program website: arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory)

Art History, Doctor of Philosophy (Ph.D.) with a concentration in historical studies

Program goal

The Ph.D. in Art History is a research-oriented degree designed to train critical and productive scholars, college and university professors, and curators and museum professionals who are well-grounded in the literature, methodology and major art historical and/or museological problems in their selected areas of study.

All doctoral students establish a program of study that includes a major field of study and a minor field of study shared by a full-time faculty member. Students in the curatorial concentration select museum studies as either the major or minor field of study.

Student learning outcomes

1. Students apply critical and analytical concepts, frameworks and methods.
2. Students contextualize scholarship in relationship to existing art historical/museological knowledge, discourse and/or debate.
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5. Students demonstrate ability to translate art historical scholarship written in a language or languages relevant to their research.
6. Students conduct scholarly inquiry that makes a scholarly professional contribution.

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Other information

For more information about the programs of study, go to arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory).

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall only	Jan 15	GRE

Special requirements

- Writing sample

Prospective students holding a master's degree in art history or a related field from VCU or any other accredited institution may apply directly to the doctoral program. Prospective students who hold only a bachelor's degree in art history or a related field also may apply directly to the Ph.D. program; if admitted, they select one of the three M.A. curriculum concentrations and complete 27 of the required 30 credit hours for the M.A. degree before beginning Ph.D. course work.

Applicants are encouraged to speak with a prospective dissertation adviser (the full-time faculty member whose research area corresponds to an applicant's interests).

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Ph.D. in Art History must meet the following requirements:

1. A statement of purpose, 750-1000 words in length, that briefly recounts applicant's academic background, describes an avenue of inquiry that the applicant expects to explore, notes applicant's professional goals beyond graduate study and explains why VCU's Ph.D. in Art History program is suited to applicant's interests
2. A research/writing sample that has a clearly articulated thesis statement, identifies and interprets primary and/or secondary sources in support of a well-argued thesis, and offers a coherent, cohesive narrative

3. Three letters of recommendation, at least two of which are from faculty members who can assess the applicant's preparation and promise for graduate work (Some applicants may choose to solicit the third letter from a museum professional who has supervised the applicant's professional work in a museum setting.)
4. Official transcripts from schools where applicant completed course work applied toward the baccalaureate or master's degree
5. An official report of GRE scores

Applications are reviewed by the program's full-time faculty members, who assess an applicant's overall package of materials with particular attention to the statement of interest and writing sample. Applicants are encouraged to correspond with individual faculty members who share their areas of research interests.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the program of study for students who have an M.A. degree upon applying for the Ph.D. program is determined on a case-by-case basis, to include at least 30 credit hours in the concentration area. Students may also be required to also complete ARTH 690, ARTH 694 and/or selected art history seminars if they have not completed equivalent courses in their master's programs and/or if their degrees were awarded in fields other than art history. Students in the curatorial concentration may also be required to take one or more museum studies course (ARTH 681-ARTH 684, ARTH 691) if their M.A. programs did not include equivalent courses.

Students who matriculate into the concentration in historical studies with only a baccalaureate degree initially complete the requirements in either the concentration in historical studies or the concentration in architectural history in the M.A. program; they then proceed to complete the following 30 credit hours.

Major and minor art historical field of study

Students complete a major and a minor art historical field of study of their choosing. The major area requires three seminars, while the minor requires two seminars. M.A./Ph.D. students may complete some of these courses while at the master's stage.

Language proficiency

Doctoral students must demonstrate competency in two foreign languages relevant to their areas of research and approved by the departmental graduate committee before admission to candidacy. Foreign language competency demonstrated for an M.A. may be applied to this requirement. The Department of Art History administers language exams and offers a course in German for art history.

Admission to candidacy

Doctoral students are admitted to candidacy after demonstrating proficiency in two foreign languages, passing the major and minor field exams administered in ARTH 772 and ARTH 773 and orally defending a dissertation prospectus previously approved by the dissertation adviser. Only after candidacy is granted may a student enroll for dissertation credits.

Dissertation

After admission to candidacy, doctoral students proceed to complete and defend a dissertation. They work under the supervision of the dissertation director, and they are required to maintain continuous enrollment of at least three credit hours per semester (excluding summer) until they have attained six hours of dissertation credit, after which they may enroll for as few as one credit per semester. The dissertation must represent independent research that is devoted to an original question or hypothesis with the appropriate development, analysis and interpretation. Successful defense of the dissertation completes the requirements for the degree. All degree requirements must be completed within eight years of the first semester of enrollment in the doctoral program (either M.A./Ph.D. or Ph.D.).

Curriculum requirements

Course	Title	Hours
ARTH 772	Major Field Exam	3
ARTH 773	Minor Field Exam	3
ARTH 774	Dissertation Proposal	3
ARTH 899	Dissertation Research	6
Select 15 credits in art history seminars from the following:		15
ARTH 591	Special Topics in Art History	
ARTH 694	Art History and Pedagogy	
ARTH 721	Seminar in Early Modern Art	
ARTH 722	Seminar in 19th-century Art	
ARTH 723	Seminar in 20th-century Art	
ARTH 725	Seminar in Pre-Columbian Art and Architecture	
ARTH 726	Seminar in African Art	
ARTH 727	Seminar in Latin American Art	
ARTH 728	Seminar in Asian Art	
ARTH 741	Seminar in Art and Theory	
ARTH 742	Seminar in Trans-millennial Art and Ideas	
ARTH 743	Seminar in Art and Representation	
ARTH 749	Seminar in Diasporic Art	
ARTH 791	Special Topics in Art History	
ARTH 797	Directed Research Project	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Margaret A. Lindauer, Ph.D.
Associate professor
malindauer@vcu.edu
(804) 828-2784

Program website: arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory)

Art History, Master of Arts (M.A.) with a concentration in historical studies

Program goal

The mission of the graduate program in art history is to equip students with requisite knowledge, skills and theoretical foundation to embark on successful careers in academia and/or museums.

The M.A. curriculum concentrations provide students with a general background in the research methods and teachings of art history in preparation for careers in museums, collections care or arts organizations. It also prepares students for the more rigorous research

demands of the Ph.D., which is the required degree for academic and curatorial careers.

Student learning outcomes

1. Students apply critical and analytical concepts, frameworks and methods.
2. Students contextualize scholarship in relationship to existing art historical/museological knowledge, discourse and/or debate.
3. Students demonstrate ability to translate art historical scholarship written in a language or languages relevant to their research.
4. Students conduct scholarly inquiry that makes a scholarly professional contribution.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall only	Jan 15	GRE

Special requirements

- Writing sample

Students with a bachelor's degree in art history or in a related field (e.g., history, anthropology, literary studies, religious studies or philosophy) are invited to apply to VCU Department of Art History graduate programs. Applicants who have completed at least 18 undergraduate semester credit hours in art history are preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Master of Arts in Art History must meet the following requirements:

1. A statement of purpose, 750-1000 words in length, that briefly recounts applicant's academic background, describes an avenue of inquiry that the applicant expects to explore, notes applicant's professional goals beyond graduate study and explains why VCU art history is suited to applicant's interests
2. A research/writing sample that has a clearly articulated thesis statement, identifies and interprets primary and/or secondary sources in support of a well-argued thesis, and offers a coherent, cohesive narrative
3. Three letters of recommendation, at least two of which are from faculty members who can assess the applicant's preparation and promise for graduate work (Some applicants may choose to solicit the third letter from a museum professional who has supervised the applicant's professional work in a museum setting.)
4. Official transcripts from schools where applicant completed course work applied toward the baccalaureate degree
5. An official report of GRE scores

Applications are reviewed by full-time faculty members who assess an applicant's overall package of materials, with particular attention to the statement of interest and writing sample.

See arts.vcu.edu/admissions/how-to-apply/graduate (http://www.arts.vcu.edu/admissions/how-to-apply/graduate) for specific information regarding the online application process.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete 30 credit hours of course work, variously distributed according to curriculum concentration.

Curriculum requirements

Course	Title	Hours
Core courses		
ARTH 683	Museum Collections	3

ARTH 690	Historiography and Methodology of Art History	3
ARTH 695	Writing Seminar I	3
ARTH 771	Writing Seminar II	3
ARTH 743	Seminar in Art and Representation	3
Art history seminars		
Select five from the following: [1]		15
ARTH 591	Special Topics in Art History	
ARTH 694	Art History and Pedagogy	
ARTH 721	Seminar in Early Modern Art	
ARTH 722	Seminar in 19th-century Art	
ARTH 723	Seminar in 20th-century Art	
ARTH 725	Seminar in Pre-Columbian Art and Architecture	
ARTH 726	Seminar in African Art	
ARTH 727	Seminar in Latin American Art	
ARTH 728	Seminar in Asian Art	
ARTH 741	Seminar in Art and Theory	
ARTH 742	Seminar in Trans-millennial Art and Ideas	
ARTH 749	Seminar in Diasporic Art	
ARTH 791	Special Topics in Art History	
ARTH 797	Directed Research Project	
Total Hours		30

[1]

At least one course must be chosen from among ARTH 721-ARTH 728.

Total graduate credit hours required (minimum) 30

Students must earn a minimum grade of B in ARTH 690 in order to enroll in subsequent graduate-level art history courses. Students must also demonstrate an ability to translate art historical scholarship published in a language relevant to their research interests and approved by the departmental graduate committee. The Department of Art History administers language exams, and it offers a course in German for art history.

For more information about the programs of study, go to arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory).

Graduate program director
Margaret A. Lindauer, Ph.D.
Associate professor
malindauer@vcu.edu
(804) 828-2784

Program website: arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory)

Art History, Master of Arts (M.A.) with a concentration in museum studies

Program goal

The mission of the graduate program in art history is to equip students with requisite knowledge, skills and theoretical foundation to embark on successful careers in academia and/or museums.

The M.A. curriculum concentrations provide students with a general background in the research methods and teachings of art history in preparation for careers in museums, collections care or arts organizations. It also prepares students for the more rigorous research demands of the Ph.D., which is the required degree for academic and curatorial careers.

Student learning outcomes

1. Students apply critical and analytical concepts, frameworks and methods.
2. Students contextualize scholarship in relationship to existing art historical/museological knowledge, discourse and/or debate.
3. Students demonstrate ability to translate art historical scholarship written in a language or languages relevant to their research.
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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall only	Jan 15	GRE

Special requirements

- Writing sample

Students with a bachelor's degree in art history or in a related field (e.g., history, anthropology, literary studies, religious studies or philosophy) are invited to apply to VCU Department of Art History graduate programs. Applicants who have completed at least 18 undergraduate semester credit hours in art history are preferred.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Master of Arts in Art History must meet the following requirements:

1. A statement of purpose, 750-1000 words in length, that briefly recounts applicant's academic background, describes an avenue of inquiry that the applicant expects to explore, notes applicant's professional goals beyond graduate study and explains why VCU art history is suited to applicant's interests
2. A research/writing sample that has a clearly articulated thesis statement, identifies and interprets primary and/or secondary sources in support of a well-argued thesis, and offers a coherent, cohesive narrative
3. Three letters of recommendation, at least two of which are from faculty members who can assess the applicant's preparation and promise for graduate work (Some applicants may choose to solicit the third letter from a museum professional who has supervised the applicant's professional work in a museum setting.)
4. Official transcripts from schools where applicant completed course work applied toward the baccalaureate degree
5. An official report of GRE scores

Applications are reviewed by full-time faculty members who assess an applicant's overall package of materials, with particular attention to the statement of interest and writing sample.

See arts.vcu.edu/admissions/how-to-apply/graduate (http://www.arts.vcu.edu/admissions/how-to-apply/graduate) for specific information regarding the online application process.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete 30 credit hours of course work, variously distributed according to curriculum concentration.

Curriculum requirements

Course	Title	Hours
Core courses		
ARTH 683	Museum Collections	3
ARTH 690	Historiography and Methodology of Art History	3
ARTH 693	Graduate Museum Internship	3
ARTH 695	Writing Seminar I	3
ARTH 771	Writing Seminar II	3
ARTH 743	Seminar in Art and Representation	3
Art history seminars		
Select two from the following:		6
ARTH 591	Special Topics in Art History	
ARTH 694	Art History and Pedagogy	
ARTH 721	Seminar in Early Modern Art	
ARTH 722	Seminar in 19th-century Art	
ARTH 723	Seminar in 20th-century Art	
ARTH 725	Seminar in Pre-Columbian Art and Architecture	
ARTH 726	Seminar in African Art	
ARTH 727	Seminar in Latin American Art	
ARTH 728	Seminar in Asian Art	
ARTH 741	Seminar in Art and Theory	
ARTH 742	Seminar in Trans-millennial Art and Ideas	
ARTH 749	Seminar in Diasporic Art	
ARTH 791	Special Topics in Art History	
ARTH 797	Directed Research Project	
Museum studies seminars		
Select two from the following:		6
ARTH 681	Museums and Communities	
ARTH 682	The Museum as Educational Institution	
ARTH 684	Curating Museum Exhibitions	
ARTH 691	Special Topics in Museum Studies	
Total Hours		30

Total graduate credit hours required (minimum) 30

Students must earn a minimum grade of B in ARTH 690 in order to enroll in subsequent graduate-level art history courses. Students must also demonstrate an ability to translate art historical scholarship published in a language relevant to their research interests and approved by the departmental graduate committee. The Department of Art History administers language exams and it offers a course in German for art history.

For more information about the programs of study, go to arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory).

Graduate program director
Margaret A. Lindauer, Ph.D.
Associate professor
malindauer@vcu.edu
(804) 828-2784

Program website: arts.vcu.edu/arthistory (http://arts.vcu.edu/arthistory)

Department of Communication Arts

TyRuben Ellingson
Assistant professor and chair

arts.vcu.edu/communicationarts

The Department of Communication Arts' mission is to empower students to create and communicate with insight, vision and voice.

By guiding students to a deeper understanding of past and present artistic practices and methods of visual problem-solving, while concurrently fostering a thoughtful awareness of future technologies and theoretical concerns, the department increases their ability to devise informed design solutions and present them in a refined and professional manner.

The communication arts faculty encourages critical-thinking, discipline and entrepreneurship — abilities critical for success in the fast and ever-changing world in which we live.

The program

Centered on a rigorous investigation of studio methods and practices, the communication arts curriculum additionally explores historical, conceptual and theoretical concerns critical to the development of a well-rounded and informed understanding of image, media, content and context.

With a history richly rooted in drawing, painting and art theory, the communication arts program is effectively tailored to provide students educational opportunities to develop the types of quality skills and meaningful understandings that are relevant and sought after in the expanding universe of communication medias.

It is a curriculum that endeavors to provide a balance between past, present and future, valuing artistic traditions and techniques, while thoughtfully embracing new tools, technologies, opportunities and outcomes.

Woven throughout the program, the study of communication arts is concerned with the powerful and timeless relationship between art and narrative — image and story — which invites each student to embrace, amplify and build upon their unique views and life experience so that they may, in the lifetime beyond university, add to humanity's ongoing evolution and unfolding.

The communication arts department offers a B.F.A. in Communication Arts as well as a B.F.A. in Communication Arts with a concentration in scientific and preparatory medical illustration.

Department of Craft and Material Studies

Susan Ganch
Associate professor and interim chair

arts.vcu.edu/craft (http://arts.vcu.edu/craft)

The Department of Craft and Material Studies explores the language of ceramics, glass, wood, fiber and metal. The department offers both a Bachelor of Fine Arts in Craft and Material Studies and a Master of Fine Arts in Fine Arts degree with concentrations in five disciplines: ceramics, fiber, furniture design, glassworking and jewelry/metalworking.

Students are encouraged to learn and explore through the traditional craft media. Together, faculty and students hone, improvise and redefine ancient technologies with new technologies; they bend and blend concepts and materials.

The Department of Craft and Material Studies is housed in a state-of-the-art facility that provides a safe and excellent physical environment in which to work. Students have access to well-equipped studios in each of the five media areas. The department shares the facilities with the departments of Sculpture, Painting and Printmaking, and Kinetic Imaging.

- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in ceramics (p. 340)
- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in fibers (p. 342)
- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in furniture design (p. 344)
- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in glassworking (p. 345)
- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in jewelry/metalworking (p. 347)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in ceramics

Program accreditation
National Association of Schools of Art and Design

Program goal

The program comprises a community of makers/artists who advance the conceptual, historical, technical and haptic aspects of clay, fiber, glass, metal and wood. The program promotes an artistic practice rooted in the values of craft. Students will investigate craft's inherent relationship to the world with fearless innovation.

Student learning outcomes

1. Aesthetic and cross-cultural understanding: The students will demonstrate mastery in aesthetic and cross-cultural understanding.
2. Understanding of the contemporary of their field: The curriculum of craft and material studies is designed to provide students with a comprehensive and up-to-date understanding of their field.
3. Critique information interpretation: The students will be able to use knowledge gained from critique to improve creative work.
4. Technique development: The students will demonstrate mastery of advanced craft techniques within their field.
5. Professional practice: The students will demonstrate leadership in their field in teaching and/or studio management.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

Student handbook: arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf (http://arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of the Arts admission requirements, applicants in the visual arts must have completed a minimum of 36 credit hours in art at the undergraduate level. Applicants should also present:

1. **Curriculum vitae/resume:** If applicant has a website, please include a link in CV/resume.
2. **Statement of purpose:** Please submit with university application and upload as PDF.
3. **References:** Provide the names and contact information for three references from professional associates such as instructors, supervisors or colleagues who can comment on the applicant's ability to succeed in a graduate program. Letters of recommendation will be submitted electronically by recommenders.
4. **Portfolio:** Provide 20 still and/or moving images. Present work in reverse chronological order with the newest work first and the oldest work last. Images are reviewed one at a time. Please include any additional information to help reviewers understand the image.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. program requires 60 credit hours, which students usually complete in two years of full-time study. The majority of credit hours are taken in the student's area of specialization. Graduate seminars, art history courses and other studio/academic electives round out the graduate student's individualized program. Studio visits and critiques with visiting artists are an important aspect of the program.

Within the studio concentration, emphasis is placed on self-motivation, individual investigation and the development of professional attitudes and skills. Graduate students are expected to demonstrate a serious commitment to their work and to develop mature ideas and forms of expression. Admission to the graduate program is highly selective and competitive.

Graduate students interact formally and informally with the faculty in their areas and with other faculty members in the School of the Arts. Each graduate student works closely with a faculty committee that meets twice a semester for critiques and discussions. At the end of the first year, students present their work to their committee and departmental faculty in a candidacy review. At the successful completion of the 60 credit hours, a thesis exhibition is mounted at the university's Anderson Gallery or at an alternative venue. A written thesis is also required.

Curriculum requirements

Course	Title	Hours
Take 30 credits in the following course:		30
CRAF 641	Graduate Studies in Clay	
Take six credits in the following course:		6
CRAF 681	Candidacy Research	
Take six credits in the following course:		6
CRAF 682	Thesis Research	
Take nine credits in the following course:		9
CRAF 690	Graduate Seminar	
Graduate art history elective [1]		3
Graduate open electives [2]		6
Total Hours		60

[1] Art history: any graduate-level (500 to 799) ARTH course

2

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

Total graduate credit hours required (minimum) 60

Suggested course sequence

Semester 1		Hours
CRAF 641	Graduate Studies in Clay	9
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
CRAF 641	Graduate Studies in Clay	6
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
Graduate open elective [1]		3
	Term Hours:	15
Semester 3		
CRAF 641	Graduate Studies in Clay	6
CRAF 682	Thesis Research	3
CRAF 690	Graduate Seminar	3
Graduate open history elective [2]		3
	Term Hours:	15
Semester 4		
CRAF 641	Graduate Studies in Clay	9
CRAF 682	Thesis Research	3
Graduate open elective [1]		3
	Term Hours:	15
	Total Hours:	60

1

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.).

2

Art history: any graduate-level (500 to 799) ARTH course

Graduate program director
Sonya Y.S. Clark
Chair, Department of Craft and Material Studies
syclark@vcu.edu
(804) 828-1750

Program website: arts.vcu.edu/craft (http://arts.vcu.edu/craft)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in fibers

Program accreditation
National Association of Schools of Art and Design

Program goal

The program comprises a community of makers/artists who advance the conceptual, historical, technical and haptic aspects of clay, fiber, glass, metal and wood. The program promotes an artistic practice rooted in the values of craft. Students will investigate craft's inherent relationship to the world with fearless innovation.

Student learning outcomes

1. Aesthetic and cross-cultural understanding: The students will demonstrate mastery in aesthetic and cross-cultural understanding.
2. Understanding of the contemporary of their field: The curriculum of craft and material studies is designed to provide students with a comprehensive and up-to-date understanding of their field.
3. Critique information interpretation: The students will be able to use knowledge gained from critique to improve creative work.
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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

Student handbook: arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf (http://arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of the Arts admission requirements, applicants in the visual arts must have completed a minimum of 36 credit hours in art at the undergraduate level. Applicants should also present:

1. **Curriculum vitae/resume:** If applicant has a website, please include a link in CV/resume.
2. **Statement of purpose:** Please submit with university application and upload as PDF.
3. **References:** Provide the names and contact information for three references from professional associates such as instructors, supervisors or colleagues who can comment on the applicant's ability to succeed in a graduate program. Letters of recommendation will be submitted electronically by recommenders.
4. **Portfolio:** Provide 20 still and/or moving images. Present work in reverse chronological order with the newest work first and the oldest work last. Images are reviewed one at a time. Please include any additional information to help reviewers understand the image.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. program requires 60 credit hours, which students usually complete in two years of full-time study. The majority of credit hours are taken in the student's area of specialization. Graduate seminars, art history courses and other studio/academic electives round out the graduate student's individualized program. Studio visits and critiques with visiting artists are an important aspect of the program.

Within the studio concentration, emphasis is placed on self-motivation, individual investigation and the development of professional attitudes and skills. Graduate students are expected to demonstrate a serious commitment to their work and to develop mature ideas and forms of expression. Admission to the graduate program is highly selective and competitive.

Graduate students interact formally and informally with the faculty in their areas and with other faculty members in the School of the Arts. Each graduate student works closely with a faculty committee that meets twice a semester for critiques and discussions. At the end of the first year, students present their work to their committee and departmental faculty in a candidacy review. At the successful completion of the 60 credit hours, a thesis exhibition is mounted at the university's Anderson Gallery or at an alternative venue. A written thesis is also required.

Curriculum requirements

Course	Title	Hours
Take 30 credits in the following course:		30
CRAF 661	Graduate Studies in Fiber	
Take six credits in the following course:		6
CRAF 681	Candidacy Research	
Take six credits in the following course:		6
CRAF 682	Thesis Research	
Take nine credits in the following course:		9
CRAF 690	Graduate Seminar	
Graduate art history elective [1]		3
Graduate open electives [2]		6
Total Hours		60

[1]

Art history: any graduate-level (500 to 799) ARTH course

[2]

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

Total graduate credit hours required (minimum) 60

Suggested course sequence

Semester 1		Hours
CRAF 661	Graduate Studies in Fiber	9
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
CRAF 661	Graduate Studies in Fiber	6
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
Graduate open elective [1]		3
	Term Hours:	15
Semester 3		
CRAF 661	Graduate Studies in Fiber	6
CRAF 682	Thesis Research	3
CRAF 690	Graduate Seminar	3
Graduate art history elective [2]		3
	Term Hours:	15
Semester 4		
CRAF 661	Graduate Studies in Fiber	9

CRAF 682	Thesis Research	3
Graduate open elective [1]		3
	Term Hours:	15
	Total Hours:	60

[1]

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

[2]

Art history: any graduate-level (500 to 799) ARTH course

Graduate program director
Sonya Y.S. Clark
Chair, Department of Craft and Material Studies
syclark@vcu.edu
(804) 828-1750

Program website: arts.vcu.edu/craft (http://arts.vcu.edu/craft)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in furniture design

Program accreditation
National Association of Schools of Art and Design

Program goal

The program comprises a community of makers/artists who advance the conceptual, historical, technical and haptic aspects of clay, fiber, glass, metal and wood. The program promotes an artistic practice rooted in the values of craft. Students will investigate craft's inherent relationship to the world with fearless innovation.

Student learning outcomes

1. Aesthetic and cross-cultural understanding: The students will demonstrate mastery in aesthetic and cross-cultural understanding.
2. Understanding of the contemporary of their field: The curriculum of craft and material studies is designed to provide students with a comprehensive and up-to-date understanding of their field.
3. Critique information interpretation: The students will be able to use knowledge gained from critique to improve creative work.
4. Technique development: The students will demonstrate mastery of advanced craft techniques within their field.
5. Professional practice: The students will demonstrate leadership in their field in teaching and/or studio management.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

Student handbook: arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf (http://arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of the Arts admission requirements,

applicants in the visual arts must have completed a minimum of 36 credit hours in art at the undergraduate level. Applicants should also present:

1. **Curriculum vitae/resume:** If applicant has a website, please include a link in CV/resume.
2. **Statement of purpose:** Please submit with university application and upload as PDF.
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4. **Portfolio:** Provide 20 still and/or moving images. Present work in reverse chronological order with the newest work first and the oldest work last. Images are reviewed one at a time. Please include any additional information to help reviewers understand the image.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. program requires 60 credit hours, which students usually complete in two years of full-time study. The majority of credit hours are taken in the student's area of specialization. Graduate seminars, art history courses and other studio/academic electives round out the graduate student's individualized program. Studio visits and critiques with visiting artists are an important aspect of the program.

Within the studio concentration, emphasis is placed on self-motivation, individual investigation and the development of professional attitudes and skills. Graduate students are expected to demonstrate a serious commitment to their work and to develop mature ideas and forms of expression. Admission to the graduate program is highly selective and competitive.

Graduate students interact formally and informally with the faculty in their areas and with other faculty members in the School of the Arts. Each graduate student works closely with a faculty committee that meets twice a semester for critiques and discussions. At the end of the first year, students present their work to their committee and departmental faculty in a candidacy review. At the successful completion of the 60 credit hours, a thesis exhibition is mounted at the university's Anderson Gallery or at an alternative venue. A written thesis is also required.

Curriculum requirements

Course	Title	Hours
Take 30 credits in the following course:		30
CRAF 621	Graduate Studies in Wood	
Take six credits in the following course:		6
CRAF 681	Candidacy Research	
Take six credits in the following course:		6
CRAF 682	Thesis Research	
Take nine credits in the following course:		9
CRAF 690	Graduate Seminar	
Graduate art history elective [1]		3
Graduate open electives [2]		6
Total Hours		60

[1] Art history: any graduate-level (500 to 799) ARTH course

[2] Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

Total graduate credit hours required (minimum) 60

Suggested course sequence

Semester 1		Hours
CRAF 621	Graduate Studies in Wood	9
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
CRAF 621	Graduate Studies in Wood	6
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
Graduate open elective [1]		3
	Term Hours:	15
Semester 3		
CRAF 621	Graduate Studies in Wood	6
CRAF 682	Thesis Research	3
CRAF 690	Graduate Seminar	3
Graduate art history elective [2]		3
	Term Hours:	15
Semester 4		
CRAF 621	Graduate Studies in Wood	9
CRAF 682	Thesis Research	3
Graduate open elective [1]		3
	Term Hours:	15
	Total Hours:	60

[1] Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

[2] Art history: any graduate-level (500 to 799) ARTH course

Graduate program director
Sonya Y.S. Clark
Chair, Department of Craft and Material Studies
syclark@vcu.edu
(804) 828-1750

Program website: arts.vcu.edu/craft (http://arts.vcu.edu/craft)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in glassworking

Program accreditation
National Association of Schools of Art and Design

Program goal

The program comprises a community of makers/artists who advance the conceptual, historical, technical and haptic aspects of clay, fiber, glass,

metal and wood. The program promotes an artistic practice rooted in the values of craft. Students will investigate craft's inherent relationship to the world with fearless innovation.

Student learning outcomes

1. Aesthetic and cross-cultural understanding: The students will demonstrate mastery in aesthetic and cross-cultural understanding.
2. Understanding of the contemporary of their field: The curriculum of craft and material studies is designed to provide students with a comprehensive and up-to-date understanding of their field.
3. Critique information interpretation: The students will be able to use knowledge gained from critique to improve creative work.
4. Technique development: The students will demonstrate mastery of advanced craft techniques within their field.
5. Professional practice: The students will demonstrate leadership in their field in teaching and/or studio management.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

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Graduation requirements

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Visit the academic regulations section for additional information on graduation requirements.

Other information

Student handbook: arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf (http://arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of the Arts admission requirements, applicants in the visual arts must have completed a minimum of 36 credit hours in art at the undergraduate level. Applicants should also present:

1. **Curriculum vitae/resume:** If applicant has a website, please include a link in CV/resume.
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Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. program requires 60 credit hours, which students usually complete in two years of full-time study. The majority of credit hours are taken in the student's area of specialization. Graduate seminars, art history courses and other studio/academic electives round out the graduate student's individualized program. Studio visits and critiques with visiting artists are an important aspect of the program.

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Curriculum requirements

Course	Title	Hours
Take 30 credits in the following course:		30
CRAF 651	Graduate Studies in Glass	
Take six credits in the following course:		6
CRAF 681	Candidacy Research	
Take six credits in the following course:		6
CRAF 682	Thesis Research	
Take nine credits in the following course:		9
CRAF 690	Graduate Seminar	
Graduate art history elective [1]		3
Graduate open electives [2]		6
Total Hours		60

[1] Art history: any graduate-level (500 to 799) ARTH course

[2] Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

Total graduate credit hours required (minimum) 60

Suggested course sequence

Semester 1		Hours
CRAF 651	Graduate Studies in Glass	9
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
CRAF 651	Graduate Studies in Glass	6
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
Graduate open elective [1]		3
	Term Hours:	15
Semester 3		
CRAF 651	Graduate Studies in Glass	6
CRAF 682	Thesis Research	3
CRAF 690	Graduate Seminar	3
Graduate art history elective [2]		3
	Term Hours:	15
Semester 4		
CRAF 651	Graduate Studies in Glass	9
CRAF 682	Thesis Research	3
Graduate open elective [1]		3
	Term Hours:	15
	Total Hours:	60

[1] Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

[2] Art history: any graduate-level (500 to 799) ARTH course

Graduate program director
Sonya Y.S. Clark
Chair, Department of Craft and Material Studies
syclark@vcu.edu
(804) 828-1750

Program website: arts.vcu.edu/craft (http://arts.vcu.edu/craft)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in jewelry/ metalworking

Program accreditation
National Association of Schools of Art and Design

Program goal

The program comprises a community of makers/artists who advance the conceptual, historical, technical and haptic aspects of clay, fiber, glass, metal and wood. The program promotes an artistic practice rooted in the values of craft. Students will investigate craft's inherent relationship to the world with fearless innovation.

Student learning outcomes

1. Aesthetic and cross-cultural understanding: The students will demonstrate mastery in aesthetic and cross-cultural understanding.
2. Understanding of the contemporary of their field: The curriculum of craft and material studies is designed to provide students with a comprehensive and up-to-date understanding of their field.
3. Critique information interpretation: The students will be able to use knowledge gained from critique to improve creative work.
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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

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Visit the academic regulations section for additional information on graduation requirements.

Other information

Student handbook: arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf (http://arts.vcu.edu/craft/files/2012/07/Craft_MaterialStudiesGraduateHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of the Arts admission requirements, applicants in the visual arts must have completed a minimum of 36 credit hours in art at the undergraduate level. Applicants should also present:

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4. **Portfolio:** Provide 20 still and/or moving images. Present work in reverse chronological order with the newest work first and the oldest work last. Images are reviewed one at a time. Please include any additional information to help reviewers understand the image.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. program requires 60 credit hours, which students usually complete in two years of full-time study. The majority of credit hours are taken in the student's area of specialization. Graduate seminars, art history courses and other studio/academic electives round out the graduate student's individualized program. Studio visits and critiques with visiting artists are an important aspect of the program.

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Graduate students interact formally and informally with the faculty in their areas and with other faculty members in the School of the Arts. Each graduate student works closely with a faculty committee that meets twice a semester for critiques and discussions. At the end of the first year, students present their work to their committee and departmental faculty in a candidacy review. At the successful completion of the 60 credit hours, a thesis exhibition is mounted at the university's Anderson Gallery or at an alternative venue. A written thesis is also required.

Curriculum requirements

Course	Title	Hours
Take 30 credits in the following course:		30
CRAF 601	Graduate Studies in Metal	
Take six credits in the following course:		6
CRAF 681	Candidacy Research	
Take six credits in the following course:		6
CRAF 682	Thesis Research	
Take nine credits in the following course:		9
CRAF 690	Graduate Seminar	
Graduate art history elective [1]		3
Graduate open electives [2]		6
Total Hours		60

[1]

Art history: any graduate-level (500 to 799) ARTH course

[2]

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

Total graduate credit hours required (minimum) 60

Suggested course sequence

Semester 1		Hours
CRAF 601	Graduate Studies in Metal	9
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
CRAF 601	Graduate Studies in Metal	6
CRAF 681	Candidacy Research	3
CRAF 690	Graduate Seminar	3
Graduate open elective [1]		3
	Term Hours:	15
Semester 3		
CRAF 601	Graduate Studies in Metal	6
CRAF 682	Thesis Research	3
CRAF 690	Graduate Seminar	3
Graduate art history elective [2]		3
	Term Hours:	15
Semester 4		
CRAF 601	Graduate Studies in Metal	9
CRAF 682	Thesis Research	3
Graduate open elective [1]		3
	Term Hours:	15
	Total Hours:	60

[1]

Graduate open electives: any 500-level or higher graduate course (Permission of instructor or program may apply.)

[2]

Art history: any graduate-level (500 to 799) ARTH course

Graduate program director
Sonya Y.S. Clark
Chair, Department of Craft and Material Studies
syclark@vcu.edu
(804) 828-1750

Program website: arts.vcu.edu/craft (http://arts.vcu.edu/craft)

Department of Dance and Choreography

Courtney B. Harris
Associate professor and chair

arts.vcu.edu/dance (http://arts.vcu.edu/dance)

The mission of the Department of Dance and Choreography is to create an environment where the student experiences the demands and challenges of the professional dancer/choreographer. In a community setting where communication, mutual respect and self-motivation are encouraged, classes provide students with disciplined training that will maximize their potential to become dancers of technical excellence, choreographers with original and powerful voices and thinkers with high academic standards.

Students are trained to be performers, choreographers and teachers in this curriculum, which emphasizes modern dance and offers dance courses in modern, improvisation, composition, choreography, music, and dance forms and dance history, as well as ballet, jazz, tap, hip-hop, ballroom, contact improvisation, dance science, anatomy for dancers, video/choreography and teaching methods for dance. Additionally, the program provides a variety of experiences in performance, choreography and production. These offerings enable students to develop as savvy, expressive artists with professional training in dance technique, knowledge of dance philosophies and a foundation in history, enabling them to function as independent and creative artists in the field of dance. VCU Dance is an accredited member of the National Association of Schools of Dance.

Department of Fashion Design and Merchandising

Patricia Brown
Associate professor and chair

arts.vcu.edu/fashion (http://arts.vcu.edu/fashion)

The Department of Fashion Design and Merchandising offers two programs. The fashion design concentration leads to a Bachelor of Fine Arts degree and the fashion merchandising concentration leads to a Bachelor of Arts degree.

Both concentrations are extremely time-consuming. Students are expected to put class attendance and study time above other campus activities or employment.

All students are required to have a laptop computer. The department can provide specifications.

Students must take classes in the sequence prescribed by the department and adhere to all prerequisites. Failure to comply can lengthen the number of semesters necessary for completion of degree requirements.

Internships provide not only experience but industry contacts, and are strongly recommended. They may be conducted primarily during the summer semester.

Department of Graphic Design

David Shields
Associate professor and chair

arts.vcu.edu/graphicdesign (http://arts.vcu.edu/graphicdesign)

Graphic design is a creative and analytical process that integrates art and technology to communicate ideas and information. The goal of the Department of Graphic Design at VCU is to educate students to become

innovators and leaders in three related areas of professional practice: print design, sequential design and interaction design.

Mission statement

The Department of Graphic Design encourages the exploration of diverse problem-solving methodologies, innovative investigations and creative research in all forms of communication. It is dedicated to excellence in teaching, scholarship, academic and creative research and professional practice. The Department of Graphic Design provides both an undergraduate and graduate education stressing creative and intellectual thinking; awareness of individual, social, cultural and communicative issues; the integration of new technology; and a concern for ethical implications and the natural environment. The program actively contributes to the university, local, state, national and international communities through its scholarly and creative activities, educational programs and service efforts.

- Design, Master of Fine Arts (M.F.A.) with a concentration in visual communications (p. 350)

Design, Master of Fine Arts (M.F.A.) with a concentration in visual communications

Program accreditation
National Association of Schools of Art and Design

Program goal

The graduate program in design with a concentration in visual communications is oriented toward individuals interested in pursuing a career in design education and/or furthering their professional practices, in conducting visual or theoretical research, and in investigating the intersections of function and expression in design problem solving.

Student learning outcomes

1. Students will be able to present fluent verbal and written explanations of research and studio activities.
2. Students will develop a personal vocabulary, approach and vision in creative work.
3. Students will demonstrate knowledge of historical, social and cultural perspectives in relation to visual communications and clarify how they influence work.
4. Students will develop the ability to create expressive forms and use them to communicate appropriately.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	

Special requirements

- International applicants should apply by Dec. 15 to ensure that application materials are received by the deadline.
- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process, including portfolio, resume, statement of purpose, letters of reference, transcripts and scores.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have taken 36 undergraduate credit hours in studio art that should include a minimum of 20 credit hours in visual communications and/or related fields. Under special circumstances, these requirements may be waived.

Interview

The department will contact selected applicants regarding the interview (may be via Skype, telephone or in person).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. is an intensive two-year, 60 credit-hour full-time program with courses only scheduled during the day. Courses are often integrated with each other during the semester.

Curriculum requirements

Course	Title	Hours
GDES 610	Visual Communications Workshop	4
GDES 611	Visual Communications Workshop	12
GDES 612	Research Methods in Visual Communications	4
GDES 621	Visual Communications Seminar	16
GDES 698	Research Documentation and Exhibition Design	3
GDES 699	Directed Thesis Research in Visual Communications	12
Graduate electives		9
Total Hours		60

Graduate electives

Course	Title	Hours
GDES 593	Visual Communications Internship	3
GDES 631	Visual Communications Teaching Practicum	3
GDES 692	Visual Communications Research/ Individual Study	3
Additional 500-, 600- and/or 700-level graduate electives within the university require approval by the program director		

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		Hours
GDES 610	Visual Communications Workshop	4
GDES 611	Visual Communications Workshop	4
GDES 621	Visual Communications Seminar	4
Graduate elective [1]		3
	Term Hours:	15
Semester 2		
GDES 611	Visual Communications Workshop	4
GDES 612	Research Methods in Visual Communications	4
GDES 621	Visual Communications Seminar	4
Graduate elective [1]		3
Candidacy review presentation		
	Term Hours:	15
Semester 3		
GDES 611	Visual Communications Workshop	4
GDES 621	Visual Communications Seminar	4
GDES 699	Directed Thesis Research in Visual Communications	4
Graduate elective [1]		3
Thesis project review		
	Term Hours:	15
Semester 4		
GDES 621	Visual Communications Seminar	4
GDES 698	Research Documentation and Exhibition Design	3
GDES 699	Directed Thesis Research in Visual Communications	8
Thesis/creative project review		
M.F.A. thesis exhibition		
Oral review		
	Term Hours:	15
	Total Hours:	60

[1] Additional 500-, 600- and/or 700-level graduate electives within the university require approval by the program director.

Graduate program director
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(804) 828-1709

Additional contact
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Chair, Department of Graphic Design
dwshields@vcu.edu
(804) 828-1709

Program website: arts.vcu.edu/graphicdesign/mfa (http://arts.vcu.edu/graphicdesign/mfa)

Department of Interior Design

Christiana Lafazani
Associate professor and chair

arts.vcu.edu/interiordesign (http://arts.vcu.edu/interiordesign)

The Department of Interior Design is accredited by the Council for Interior Design Accreditation. The mission of the department is to provide an intellectually rigorous, studio-based experience grounded in the issues of interior architecture. The department develops in its students an enduring passion and curiosity for their work, a determination to continually seek quality in their endeavors, an ability to reflect constructively upon their actions as individuals and a responsibility for their lifelong education. The department focuses students' professional activities while encouraging connections between these activities and the larger forum of ideas that enrich their culture and environment. The Bachelor of Fine Arts in Interior Design program prepares students for careers in interior design or entry into programs of advanced study.

The department also offers a Master of Fine Arts in Design with a concentration in interior environments with a professional entry-level option and a post-professional option. These tracks seek to produce competent creative designers whose design solutions are based on human response in the contemporary environment. Mastery of design skills, development of productive habits, knowledge of resources and an

awareness of interrelated disciplines equip the student with the tools and expertise necessary to pursue creative design positions.

The department relates with the professional interior design community through a variety of activities. The faculty invites featured speakers to share experiences, participate in the annual ASID EXPO, facilitate mentorships with professional designers and support student internships. An active student chapter of the American Society of Interior Designers provides additional enriching opportunities for student involvement.

The department offers limited accelerated undergraduate preparation for those individuals who lack full preparation. Assessment of the individual candidate's needs will determine the scope of the preparatory course work. This is an opportunity to gain the skills and design experiences required to qualify for admission to the graduate degree program.

The department has a very comprehensive website with extensive information about the program, interior design in general, faculty, student work and the department newsletter. In advance of scheduling a meeting for department advising or for application to the program, students should review the website at arts.vcu.edu/interiordesign (http://arts.vcu.edu/interiordesign).

- Design, Master of Fine Arts (M.F.A.) with a concentration in interior environments – post-professional option (p. 352)
- Design, Master of Fine Arts (M.F.A.) with a concentration in interior environments – professional entry-level option (p. 354)

Design, Master of Fine Arts (M.F.A.) with a concentration in interior environments – post-professional option

Program accreditation
Council for Interior Design Accreditation

Program goal

The mission of the Department of Interior Design in VCU's School of the Arts is to provide an intellectually rigorous, studio-based experience grounded in the issues of interior architecture. The department develops in its students an enduring passion and curiosity for their work, a determination to continually seek quality in their endeavors, an ability to reflect constructively upon their actions as individuals, and a responsibility for their lifelong education. The department focuses a student's professional activities while encouraging connections between these activities and a larger forum of ideas that enrich their culture and their environment.

Student learning outcomes

1. Students will demonstrate professional values.
2. Student work will demonstrate advanced design theory.
3. Student work will demonstrate advanced knowledge of interior design.
4. Student work will demonstrate effective communication.
5. Students will demonstrate a foundation in business and professional practices.

Concentration in interior environments – post-professional option

The post-professional option is a subconcentration of the interior environments concentration, one of about 10 available nationally, that allows students who already have undergraduate degrees in interior design or architecture the opportunity to develop an individualized direction in scholarship. Admission is highly selective and open only to students who have demonstrated a high caliber of work at the undergraduate and/or master's level.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 1	TOEFL or IELTS scores for international students only

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process and TOEFL score requirements.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum requirements:

1. An interview (recommended, but not required)
2. Previous university/college transcripts (one official copy)
3. Three letters of recommendation to be submitted electronically through the online application process
4. Essay: three-to-five page (minimum) sample of academic writing
5. Written personal statement (one to two pages)
6. A resume
7. TOEFL score (international students only) – 600 paper/2500 computer/100 Internet
8. A portfolio with samples of design work (Applicants will be directed to upload portfolio images and/or video after they start the application process.)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a minimum of 60 credit hours is required within prescribed courses. A research-design project is required to complete the program of study. This project is undertaken and developed in the context of IDES 699 and must consist of the testing of an original idea that is supported by research. This information will be synthesized through the design development process and culminate in an individual creative project of complex scale and scope. Documentation must follow established guidelines and be presented in a form that can be retained by the department and the university. On completion of the thesis, students participate in an oral examination and a graduate exhibition.

Curriculum requirements

Course	Title	Hours
IDES 601	Graduate Interior Environments Studio	6
Select one of the following:		18
IDES 623	Advanced Design Studies	
IDES 635	Teaching Practicum in Interior Environments	
Open electives		
Take 12 credits in the following course:		12
IDES 690	Graduate Seminar in Interior Environments	
IDES 693	Interior Design Internship (optional; may substitute additional elective credit hours)	3-6
IDES 699	Creative Project - Thesis	6
Electives		12

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		Hours
IDES 601	Graduate Interior Environments Studio	6
IDES 690	Graduate Seminar in Interior Environments	3
Design/arts electives [1]		6
	Term Hours:	15
Semester 2		
IDES 601	Graduate Interior Environments Studio	6
IDES 690	Graduate Seminar in Interior Environments	3
Design/arts electives [1]		6
Candidacy review occurs upon successful completion of the second semester		
	Term Hours:	15
Summer		
IDES 693	Interior Design Internship (optional; may be substituted for elective credit hours) [1]	3-6
	Term Hours:	0
Semester 3		
IDES 601	Graduate Interior Environments Studio	6
IDES 690	Graduate Seminar in Interior Environments	3
Select one of the following:		6
IDES 635	Teaching Practicum in Interior Environments	6
IDES 623	Advanced Design Studies	6
Open electives		6
	Term Hours:	15
Semester 4		
IDES 623	Advanced Design Studies (or open electives)	6
IDES 690	Graduate Seminar in Interior Environments	3
IDES 699	Creative Project - Thesis	6
	Term Hours:	15
	Total Hours:	60

1

At least 12 credit hours of electives must be studio classes. Electives must be graduate-level and approved by the program director.

Graduate program director
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Additional contact
Robert D. Smith, M.F.A.
Assistant professor and administrative director
smithrd@vcu.edu
(804) 827-4574

Program website: arts.vcu.edu/interiordesign (http://arts.vcu.edu/interiordesign)

Design, Master of Fine Arts (M.F.A.) with a concentration in interior environments – professional entry-level option

Program accreditation
Council for Interior Design Accreditation

Program goal

The mission of the Department of Interior Design in VCU's School of the Arts is to provide an intellectually rigorous, studio-based experience grounded in the issues of interior architecture. The department develops in its students an enduring passion and curiosity for their work, a determination to continually seek quality in their endeavors, an ability to reflect constructively upon their actions as individuals, and a responsibility for their lifelong education. The department focuses a student's professional activities while encouraging connections between these activities and a larger forum of ideas that enrich their culture and their environment.

Student learning outcomes

1. Students will demonstrate professional values.
2. Student work will demonstrate advanced design theory.
3. Student work will demonstrate advanced knowledge of interior design.
4. Student work will demonstrate effective communication.
5. Students will demonstrate a foundation in business and professional practices.

Concentration in interior environments – professional entry-level option

The professional entry-level track is a 60-72 credit-hour program for second-degree seekers who have a proven record of academic excellence in a field other than architecture or interior design and are interested in pursuing a career in interior design. The structure of the track echoes the B.F.A. in Interior Design program in content, but advances the student at an accelerated rate during the first year and summer, bringing students parallel with the curriculum of the post-professional track by the second year.

The curriculum is highly sequenced, and students are admitted to the program for the fall semester only. All incoming students are required to take part in an intensive workshop in the summer that introduces and develops drawing, presentation skills and an understanding of two- and three-dimensional design methods. Students must successfully pass the workshop with a minimum grade of B to begin the professional entry-level track. Applicants who have an art or design background are strongly encouraged to submit a portfolio for review with their application. PowerPoint is the preferred format for the portfolio. Applicants are also required to submit three letters of recommendation and a three-to-five page writing sample.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 1	TOEFL or IELTS scores for international students only

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process and TOEFL score requirements.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum requirements:

1. An interview (recommended, but not required)
2. Previous university/college transcripts (one official copy)
3. Three letters of recommendation to be submitted electronically through the online application process
4. Essay: three-to-five page (minimum) sample of academic writing
5. Written personal statement (one to two pages)
6. A resume
7. TOEFL score (international students only) – 600 paper/2500 computer/100 Internet
8. A portfolio with samples of design work (Applicants will be directed to upload portfolio images and/or video after they start the application process.)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a minimum of 60 credit hours is required within prescribed courses. A research-design project is required to complete the program of study. This project is undertaken and developed in the context of IDES 699 and must consist of the testing of an original idea that is supported by research. This information will be synthesized through the design development process and culminate in an individual creative project of complex scale and scope. Documentation must follow established guidelines and be presented in a form that can be retained by the department and the university. On completion of the thesis, students participate in an oral examination and a graduate exhibition.

Curriculum requirements

Prerequisite

Students with no art or design background must successfully complete this class with a minimum grade of B as a prerequisite for enrolling in the program.

Course	Title	Hours
Take 2-12 credits in the following:		2-12
IDES 500	Art and Design Methods Workshop	

Required courses

Course	Title	Hours
IDES 501	Introductory Graduate Design Studio I	6
IDES 502	Introductory Graduate Design Studio II	6
IDES 511	Introductory Graduate Graphics I	3
IDES 512	Introductory Graduate Graphics II	3
IDES 521	Advanced Material Studies for Interior Environments	2
IDES 522	Environmental Factors for Interior Environments	2
IDES 601	Graduate Interior Environments Studio	6
IDES 611	Advanced Graphics for Interior Environments I	2
IDES 612	Advanced Graphics for Interior Environments II	2
IDES 623	Advanced Design Studies	3
IDES 624	Advanced Furniture Design (or elective)	2
IDES 626	Advanced Light and Color for Interior Environments	2
IDES 631	Ethics and Business Procedures for Interior Environments	2
IDES 651	History and Theory of Interior Environments I	2
IDES 652	History and Theory of Interior Environments II	2
IDES 690	Graduate Seminar in Interior Environments	3
IDES 693	Interior Design Internship	4-6
IDES 699	Creative Project - Thesis	6
Arts or other graduate-level elective (must be approved by program director)		2-4
Total Hours		60-64

Total graduate credit hours required (minimum) 60

Note: Candidacy/portfolio review occurs upon successful completion of the second semester.

Graduate program director
Christiana Lafazani, M.F.A., I.D.E.C., N.C.I.D.Q.
Associate professor, graduate director and interim chair, Department of Interior Design
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Additional contact
Robert D. Smith, M.F.A.
Assistant professor and administrative director
smithrd@vcu.edu
(804) 827-4574

Program website: arts.vcu.edu/interiordesign (http://arts.vcu.edu/interiordesign)

Department of Kinetic Imaging

Stephen Vitiello
Professor and interim chair

arts.vcu.edu/kineticimaging (http://www.arts.vcu.edu/kineticimaging)

The Department of Kinetic Imaging prepares students to use video, animation and sound for the purpose of art-making, self-expression and experimentation. The kinetic imaging programs are designed for students who want to study video art, sound design and experimental

two-dimensional and three-dimensional animation. Emphasis is placed on artistic uses of the media.

The department offers an undergraduate curriculum leading to a Bachelor of Fine Arts in Kinetic Imaging as well as a graduate level program that results in a Master of Fine Arts in Fine Arts.

- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in kinetic imaging (p. 356)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in kinetic imaging

Program accreditation
National Association of Schools of Art and Design

Program goals

The Department of Kinetic Imaging is committed to the artistic exploration of video, animation and sound. The M.F.A. program emphasizes the extension of these practices into the arts and their connection to contemporary issues in visual culture.

Graduate students in the M.F.A. program are exposed to a vigorous visiting artist schedule. Through studio reviews, seminars and research, the students are expected to build an awareness of contemporary and historical definitions of art that will influence their creative work. In addition to their own investigations, graduate students participate in and contribute to the undergraduate program.

While the graduate program is generally a two-year, four-semester in-residence program, students are expected to continue pursuits either on campus or at an alternative site throughout the calendar year.

Student learning outcomes

1. Through studio reviews, seminars and research, students are expected to build an awareness of contemporary and historical definitions of art that will influence their creative work.
2. Students will demonstrate critical thinking and conceptual problem-solving, with the ability to contribute to and challenge the rapidly evolving dialogue in media arts.
3. Students? creative work will demonstrate an engagement with critical thinking and conceptual problem-solving.
4. Students will demonstrate the ability to carry their work and critical inquiry to professional platforms such as public exhibitions, performance and/or scholarly publication. This includes knowledge of the various venues available to support and enhance their professional careers and the ability to accurately communicate what their work is addressing and who they are as artists.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the requirements listed on the website above.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete 60 credit hours total, which

includes studio, seminar and elective courses. While seminar and studio courses are offered through the kinetic imaging program, these credit hours can include other courses from within the fine arts degree program with the approval of the graduate program director. Additional elective courses are drawn from approved courses in participating units.

To graduate, degree applicants must achieve an overall grade point average of 3.0 (B) on a 4.0 scale with a grade of C in no more than two courses. The GPA for graduation will be based on all graduate courses attempted after acceptance into the program.

The M.F.A. in Fine Arts with a concentration in kinetic imaging will be a 60-credit hour program consisting of eight credit hours of graduate studio, four credit hours of graduate seminar and three credit hours of electives[1] (15 credit hours) each semester. The program will typically take two years of full-time study to complete.

The M.F.A. in Fine Arts with a concentration in kinetic imaging is consistent with national standards established by the accrediting National Association of Schools of Art and Design.

The curriculum for the M.F.A. in Fine Arts with a concentration in kinetic imaging is built on the understanding that incoming students will exhibit high levels of ability and quickly demonstrate a serious commitment to their work and artistic development. Students accepted into the graduate program will possess a competitive portfolio and a minimum 3.0 grade point average, with a B.A., B.F.A., B.S. or M.A. from an accredited university. Due to the interdisciplinary nature of these media arts disciplines, applicants with degrees in other disciplines will be encouraged to apply. At the end of the first year, students will go through an advanced candidacy review, where they will present and defend their work before their graduate committee, which will be composed of members from the Department of Kinetic Imaging and other fine arts departments, following the current M.F.A. model. During the final semester, graduates will be required to complete a body of work resulting in an M.F.A. exhibition and written thesis, which will serve as the capstone elements of the degree program and be evaluated by the student's graduate committee.

1

Electives may be chosen from among all university courses listed as 500-level or greater and require approval from a faculty adviser.

Curriculum requirements

Course	Title	Hours
Take 32 credits in the following course:		32
KINE 600	Graduate Studio [1]	
Take 16 credits in the following course:		16
KINE 692	Graduate Seminar [2]	
Select 12 credits of approved graduate electives [3]		12
Total Hours		60

1

An exhibition will be required as a prerequisite for graduation.

2

Enrollment in the graduate seminar is mandatory for the duration of the student's study in the graduate program.

3

Electives may be chosen from among all university courses listed as 500-level or greater and require approval from a faculty adviser.

Department electives

Course	Title	Hours
KINE 510	Foundations in Media	3
KINE 591	Topics in Contemporary Media	3
KINE 691	Independent Study	1-4
KINE 695	Advanced Sound	3

Total graduate credit hours required (minimum) 60

Suggested plan of study

Each semester the student enrolls in 15 credit hours as follows:

Course	Title	Hours
KINE 600	Graduate Studio	8
KINE 692	Graduate Seminar	4
Approved graduate elective		3
Total Hours		15

Graduate program director
Stephen Vitiello
Professor
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(804) 828-3581

Program website: arts.vcu.edu/kineticimaging/mfa (http://arts.vcu.edu/kineticimaging/mfa)

Department of Music

Terry Austin, Ph.D.
Professor and interim chair
arts.vcu.edu/music (http://arts.vcu.edu/music)

VCU Music: Educating musicians to shape the stage, the classroom and the world

The Department of Music is committed to the advancement of Western art music and jazz as academic disciplines, as fields of professional endeavor and as significant expressions of culture. Entrance and graduation requirements comply with the National Association of Schools of Music guidelines. The department offers degree programs at the baccalaureate and master's levels, and each of them is described in detail on individual program pages within the Bulletins website. Students in the VCU Music community are involved in a musically rich environment of studio lessons, small classes, independent study and performances. They hear outstanding professional performers in the classical and jazz traditions and attend on-campus master classes with major touring artists. Student soloists also may appear with regional and university ensembles. Through the Mary Anne Rennolds Chamber Concert Series and other events, the department is one of the region's major sponsors of music performances. Approximately 250 students choose to major in music, with many other students from throughout the university taking courses and participating in ensembles. There are 26 full-time faculty, more than half of whom hold doctorates, in addition to 45 part-time instructors. Among the faculty are internationally recognized performers, composers, researchers and teachers — musician-educators who are active in all facets of the professional music world. The faculty

includes members and regular performers with ensembles that include the Richmond and Virginia symphonies, the New York Philharmonic, the Virginia Opera, Rhythm and Brass, and the Atlantic Chamber Ensemble. The faculty maintains a high level of recognition through each individual's publications, recordings, international performances and lectures. The department is housed in two buildings. The principal facility is the W.E. Singleton Center for the Performing Arts, which includes the 502-seat Sonia Vlahcevic Concert Hall, faculty offices, rehearsal rooms and special studios for organ, percussion and piano. The James W. Black Music Center has a 347-seat recital hall, classrooms, practice rooms, rehearsal spaces, faculty offices and studios.

Admission and auditions

An audition and interview are necessary for admission to programs in the Department of Music. Students must also meet the general admission requirements of the university. For audition information contact Virginia Commonwealth University, Department of Music, 922 Park Ave., Box 842004, Richmond, VA 23284-2004; phone (804) 828-1169 or email apply4music@vcu.edu.

Music education candidacy

In order to achieve candidacy, music education majors must maintain a minimum cumulative GPA of 2.8 and must demonstrate satisfactory completion of the Praxis I, ACT or SAT. Music education students who do not achieve candidacy will not be allowed to continue in the music education program, but may continue in one of the other music degree programs provided they meet the requirements.

Courses for non-majors

Students majoring in a field other than music are welcome and encouraged to register for ensembles, private lessons and a variety of classroom courses in music specifically designed for the non-music major. Some courses require an audition.

Grades and achievement levels

All music majors are required to maintain a cumulative GPA of 2.0 and pass at least one applied achievement level within any two-semester period (not including summers) in order to continue as music majors. Jazz studies majors must pass one applied achievement level of classical instrument study per two-semester period (not including summers) and at least one jazz applied music level within the first three semesters in order to maintain a jazz studies concentration. All music students also must pass MHIS 145-MHIS 146 by the end of the fourth semester. Any student who fails to meet or maintain these standards will not be allowed to continue as a music major. A student may audition for readmission into the department as a music major only with permission from the Department of Music.

A cumulative GPA of 2.8 is required for music education students to qualify for student teaching placement. Music education students who do not maintain a cumulative 2.8 GPA will not be allowed to continue in the music education track, but may continue in the Bachelor of Arts program or the Bachelor of Music performance track if they meet the minimum requirements that apply to those respective degree programs.

Electives in music

Students majoring in a field other than music may register for ensembles, private lessons and a variety of classroom courses in music. Classes in music appreciation, African-American music, introduction to writing music, basic music skills and special offerings in music are specifically designed for the non-music major.

Internship in music

Interested students should consult with a faculty member closely associated with the appropriate field. As the student approaches junior academic standing, he or she may apply to the department for participation in APPM 493. Applications will be reviewed on the basis of academic GPA, instructor recommendation(s), professional promise, and demonstrated interest and competence in the area of study. The student must possess a minimum 2.5 overall GPA with a minimum 3.0 GPA in major course work in music. All students (including transfers) must have completed a minimum of 60 credits.

All internships for credit are approved by the Department of Music. The experience may also be coordinated by VCU's Cooperative Education/ Internship Program. The latter office requires completion of an application and resume.

Fees

All students registering for applied lessons (APPL 200) pay an applied lesson fee. Current fee rates for applied lessons (http://www.enrollment.vcu.edu/accounting/%20tuition_fees.html) can be found on the Student Accounting website.

Recital/convocation attendance

All undergraduate majors are required to pass four semesters of recital/ convocation attendance for graduation. During each semester of enrollment, the student must attend a minimum number of concerts or recitals plus departmental convocations in order to pass the requirement.

Master class

This requirement consists of participation in weekly master classes in the student's applied major area. For students in the Bachelor of Music program, enrollment in master class is required for each semester that students enroll for a two-credit lesson on their principal performing instrument. A minimum of eight semesters in the performance concentration (jazz studies majors take four semesters classical and four semesters jazz) and six semesters for the music education concentration are required. Students in the Bachelor of Arts in Music program must also enroll in master class each semester they take a two-credit lesson until they complete a minimum of four semesters of master class on the same instrument.

Ensemble requirements

To ensure consistent skill development in ensemble settings, only one large ensemble credit per semester will be counted toward a student's large ensemble requirements. Students whose principal instrument is a band or orchestral instrument must satisfy the large ensemble requirement by performing in a large ensemble on that instrument. Students whose principal instrument is voice must satisfy the requirement by performing in a large choral ensemble on voice. Those whose principal instrument is piano must complete four of their six elective credits by playing the piano in ensembles. Jazz studies majors must have ensembles approved in advance by their adviser or program director. Bachelor of Arts students must earn six credits in either large or small ensembles.

- Music, Master of (M.M.) with a concentration in music education (p. 359)

Music, Master of (M.M.) with a concentration in music education

Program accreditation
National Association of Schools of Music

Program goal

The Master of Music with a concentration in music education program at VCU is designed to provide the opportunity for advanced, graduate study for the practicing professional music educator. It is the goal of the Department of Music that successful graduates emerge as leaders and innovators in the profession.

The curricular goal of the program is to provide flexibility in addressing the individual pedagogical interests of each student as well as the framework and foundations needed for continued advanced study in music education at the doctoral level. As part of this design, the degree is offered exclusively as a three-summer program, with continuous enrollment required following admittance to degree candidacy (fall and spring semesters prior to third summer). This design provides a "real-world" option for the practicing music educator to enter graduate study.

Student learning outcomes

1. Understand research in music education
2. Understand current issues in music education
3. Develop advanced pedagogical skills

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.M.	Summer only	Apr 1	None

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Baccalaureate degree in music or music education from an accredited institution
2. Virginia teaching certification in PK-12 music education (or same from a reciprocal state)
3. Written statement of personal philosophy of music education – used to assess thoughtful reflection on larger issues of the profession, ability to express thought in clearly written English and as diagnosis for specific deficiencies in this area
4. Three letters of recommendation – must include letter from persons who have directly observed applicant's teaching
5. Interview with the director of music education

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the Master of Music program requires a minimum of 30 graduate credit hours. The summer program is intended to be completed in three consecutive summer sessions and is structured into three cognate areas: music education, music pedagogy and professional education. Music education and music pedagogy cognate courses are offered on a rotating basis, with electives in music pedagogy developed and offered on an ongoing basis. This structure permits the student to enter the program at any given point in the sequence. The student will apply for degree candidacy following the completion of 18 credit hours. It is recommended that students enroll in eight to nine credit hours each summer. Final project credit hours are earned through online enrollment during the fall/spring semester and in residency during the final summer session following admittance to degree candidacy.

Curriculum requirements

Cognate areas

Course	Title	Hours
Music education		
MUED 600	Seminar in Music Education	3
MUED 610	Psychology of Music	3
MUED 620	Introduction to Research in Music Education	3
Take three credits in the following course:		3
MUED 783	Final Project in Music Education	
Music pedagogy		
Select a minimum of 12 credit hours from either the instrumental focus or choral focus areas:		12
Instrumental focus:		
MUED 614	Instrumental Conducting Techniques	
MUED 616	Researching the Wind Band: Strategies and Resources	
MUED 618	History and Literature of the Wind Band	
MUED 583	Special Workshop in Music Education (MUED electives)	
or MUED 591	Topics in Music Education	
Choral focus:		
MUED 604	Choral Conducting and Rehearsal Techniques	
MUED 606	Choral Literature and Style	
MUED 608	Teaching the Adolescent Singer	
MUED 583	Special Workshop in Music Education (MUED electives)	
or MUED 591	Topics in Music Education	
Professional education		
A focus on areas of education of interest to student: to be determined by student and adviser, with adviser approval. May include the following:		6
EDUS 605	Child and Adolescent Development	
EDUS 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 662	Educational Measurement and Evaluation	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
EDUS 701	Urban Education	
ADMS 600	Public School Administration	
ADMS 606	Organizational Behavior and Change in Educational Settings	
ADMS 611	School Law	
Other graduate-level School of Education offerings		
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
David J. Greennagel, Ph.D.
Director of music education
djgreennagel@vcu.edu
(804) 828-8523

Additional contact
Department of Music
Admissions Office
apply4music@vcu.edu
(804) 828-1167

Program website: arts.vcu.edu/music/areas-of-study/music-education/graduate-program (http://arts.vcu.edu/music/areas-of-study/music-education/graduate-program)

Department of Painting and Printmaking

Noah Simblist, Ph.D.
Associate professor and chair

arts.vcu.edu/paintingprintmaking (http://arts.vcu.edu/paintingprintmaking)

The Department of Painting and Printmaking offers an undergraduate program that earns a Bachelor of Fine Arts in Painting and Printmaking, as well as a graduate program of study that leads to the Master of Fine Arts in Fine Arts. Students admitted to the programs are expected to have a high level of competence in either painting or printmaking. The graduate program is designed to encourage the development of professional attitudes and skills, with an emphasis on individual investigation.

The department is housed in the Fine Arts Building with 15 individual graduate studios plus a large graduate printmaking area in addition four state-of-the-art undergraduate printmaking studios: etching, lithography, screenprinting and digital. These facilities provide an excellent physical environment for the programs with easy access to the other fine art areas of sculpture and crafts. Established in 1928, the Department of Painting and Printmaking was the first department in what has become the School of the Arts. For nearly 70 years, the department has made significant contributions to the development of the School of the Arts' reputation as one of the premier art schools in the country.

The department supports an active and ambitious program of visiting artists and lecturers. Leading figures in the world of contemporary art visit to discuss their work, critique, visit studios, conduct workshops and meet with students throughout the year.

The Master of Fine Arts degree is the terminal degree in the studio areas of fine arts and is a requirement for most college and university teaching positions. Many graduate students have gained teaching experience in the department as part of their assistantship responsibilities, teaching classes in painting, drawing and printmaking. The department assists graduate students financially through a variety of teaching assistantships, graduate assistantships and scholarships.

- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in painting (p. 360)
- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in printmaking (p. 362)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in painting

Program accreditation
National Association of Schools of Art and Design

Program goals

The graduate program advances the development of:

1. Individual studio and scholarly talents, interests and philosophies, used creatively to both expand and preserve our cultural heritage
2. Professional studio competence as exemplified by a significant body of work
3. Individuals with the potential to solve contemporary problems in all aspects of the visual arts and to explore and address new questions and issues
4. Professional competence in the dissemination of knowledge, including logical, clear verbal and written presentation of aesthetic ideas in teaching and other contexts
5. Scholarly competence in the organization, evaluation and interpretation of knowledge
6. Technical proficiency in relation to the tools, techniques and materials used in their field and the expertise to visually articulate their ideas
7. Proficiency regarding critical thinking and conceptual problem-solving with particular focus on the context and practice of painting and printmaking

Student learning outcomes

1. Define work in relation to history and practice
2. Engage fully in critical discourse
3. Increase knowledge of materials and techniques
4. Develop professional practice: engage in opportunities that develop the experience required to manage a creative professional career

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the requirements listed on the website above.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. in Fine Arts with a concentration in painting or printmaking requires 60 credit hours and is usually completed in two years of full-time study. Most of these credit hours are in studio areas and are augmented by related courses in specialized academic fields. A graduate seminar meets weekly and addresses topics related to contemporary art and theory. Two required semesters of art and critical theory are presented in a course that surveys the major themes of contemporary art criticism.

Graduate students meet with individual committees composed of three faculty members. Each committee and student conducts an ongoing dialogue and critique. At the end of the second semester students discuss their work at a candidacy critique comprising their committee and additional faculty members. M.F.A. recipients mount a comprehensive exhibition of their work at the university's Anderson Gallery at the successful conclusion of the program's second year.

The Master of Fine Arts program is based on intensive studio practice at an advanced level in the areas of painting and printmaking. The program is highly selective and is presently limited to 15 participants.

Curriculum requirements

Course	Title	Hours
PAPR 527 & PAPR 528	Art and Critical Theory and Art and Critical Theory	6
PAPR 591	Topics in Painting and Printmaking (critical issues)	3
PAPR 591	Topics in Painting and Printmaking (professional practices for fine artists)	3
Take 24 credits in one of the following:		24
PAPR 605	Graduate Painting	
or PAPR 615	Graduate Printmaking	
Take 12 credits in the following:		12
PAPR 690	Graduate Seminar	
Select 12 elective credits from the list below		12
Total Hours		60

Recommended elective courses

Course	Title	Hours
ARTH 591	Special Topics in Art History	1-6
ARTS 591	Special Topics	1-4
ARTS 592	Individual Projects/Fieldwork	1-6
KINE 690	Graduate Seminar (with permission of graduate adviser)	4
KINE 695	Advanced Sound (with permission of instructor)	3
PAPR 615	Graduate Printmaking	3,6
PHTO 690	Seminar in Photography and Film (with permission of instructor)	3

Total graduate credit hours required (minimum) 60

Typical plan of study

Semester 1		Hours
PAPR 527	Art and Critical Theory	3
PAPR 591	Topics in Painting and Printmaking (critical issues)	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
PAPR 528	Art and Critical Theory	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
Elective		3
	Term Hours:	15
Semester 3		
PAPR 591	Topics in Painting and Printmaking (professional practices for fine artists)	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
Elective		3
	Term Hours:	15
Semester 4		
Take nine credits in:		9
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	3-6
PAPR 690	Graduate Seminar	3
Academic elective		3
	Term Hours:	15
	Total Hours:	60

Graduate program director
Holly Morrison
Associate professor, Department of Painting and Printmaking
hjmorrison@vcu.edu
(804) 827-1697

Additional contact
Ron B. Johnson
Assistant professor and administrative director
johnsonrb@vcu.edu
(804) 828-2787

Program website: arts.vcu.edu/paintingprintmaking (http://arts.vcu.edu/paintingprintmaking)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in printmaking

Program accreditation
National Association of Schools of Art and Design

Program goals

The graduate program advances the development of:

1. Individual studio and scholarly talents, interests and philosophies, used creatively to both expand and preserve our cultural heritage
2. Professional studio competence as exemplified by a significant body of work
3. Individuals with the potential to solve contemporary problems in all aspects of the visual arts and to explore and address new questions and issues
4. Professional competence in the dissemination of knowledge, including logical, clear verbal and written presentation of aesthetic ideas in teaching and other contexts
5. Scholarly competence in the organization, evaluation and interpretation of knowledge
6. Technical proficiency in relation to the tools, techniques and materials used in their field and the expertise to visually articulate their ideas

7. Proficiency regarding critical thinking and conceptual problem-solving with particular focus on the context and practice of painting and printmaking

Student learning outcomes

1. Define work in relation to history and practice
2. Engage fully in critical discourse
3. Increase knowledge of materials and techniques
4. Develop professional practice: engage in opportunities that develop the experience required to manage a creative professional career

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

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Degree requirements

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Graduate students meet with individual committees composed of three faculty members. Each committee and student conducts an ongoing dialogue and critique. At the end of the second semester students discuss their work at a candidacy critique comprising their committee and additional faculty members. M.F.A. recipients mount a comprehensive exhibition of their work at the university's Anderson Gallery at the successful conclusion of the program's second year.

The Master of Fine Arts program is based on intensive studio practice at an advanced level in the areas of painting and printmaking. The program is highly selective and is presently limited to 15 participants.

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PAPR 591	Topics in Painting and Printmaking (professional practices for fine artists)	3
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PAPR 605	Graduate Painting	
or PAPR 615	Graduate Printmaking	
Take 12 credits in the following:		12
PAPR 690	Graduate Seminar	
Select 12 elective credits from the list below		12
Total Hours		60

Recommended elective courses

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ARTS 591	Special Topics	1-4
ARTS 592	Individual Projects/Fieldwork	1-6
KINE 690	Graduate Seminar (with permission of graduate adviser)	4
KINE 695	Advanced Sound (with permission of instructor)	3
PAPR 615	Graduate Printmaking	3,6
PHTO 690	Seminar in Photography and Film (with permission of instructor)	3

Total graduate credit hours required (minimum) 60

Typical plan of study

Semester 1		Hours
PAPR 527	Art and Critical Theory	3
PAPR 591	Topics in Painting and Printmaking (critical issues)	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
	Term Hours:	15
Semester 2		
PAPR 528	Art and Critical Theory	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
Elective		3
	Term Hours:	15
Semester 3		
PAPR 591	Topics in Painting and Printmaking (professional practices for fine artists)	3
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
Elective		3
	Term Hours:	15
Semester 4		
PAPR 605 or PAPR 615	Graduate Painting or Graduate Printmaking	6
PAPR 690	Graduate Seminar	3
Academic elective		3
Studio elective		3
	Term Hours:	15
	Total Hours:	60

Graduate program director
Holly Morrison
Associate professor, Department of Painting and Printmaking
hjmorrison@vcu.edu
(804) 827-1697

Additional contact
Ron B. Johnson
Assistant professor and administrative director
johnsonrb@vcu.edu
(804) 828-2787

Program website: arts.vcu.edu/paintingprintmaking (http://arts.vcu.edu/paintingprintmaking)

Department of Photography and Film

Sasha Waters Freyer
Associate professor and chair

arts.vcu.edu/photofilm (http://arts.vcu.edu/photofilm)

The Department of Photography and Film aims to facilitate a comprehensive artistic, technical and intellectual understanding and use of the mediums of photography and film; to provide a rigorous education in the arts, specifically in photographic and moving image media, and a broad education in other academic subjects; to foster a climate that inspires creativity, intellectual curiosity, freedom of expression and critical-thinking. The department fosters a pluralistic approach that allows both faculty and students to expand the traditional boundaries of the respective media and engage in multidisciplinary practice.

The department offers undergraduate concentrations in photography and filmmaking resulting in a Bachelor of Fine Arts in Photography and Film, as well as a graduate program that leads to a Master of Fine Arts in Fine Arts with a concentration in photography and film.

To promote student development and research of contemporary art practice and theory, the Department of Photography and Film presents a diverse and active visiting artist program. Through lectures, critiques and research courses, students are exposed to the valuable insights of respected international artists, scholars and critics. In addition, the visiting artists teach topics courses exploring the current artistic and conceptual foundations found in their own work. Graduate students are encouraged to establish an individual critical dialogue with the visiting artists and faculty and attain a strong critical and historical basis for their work.

The facilities include several critique and screening rooms; a large black-and-white darkroom; a large state-of-the-art digital photography and film editing lab; a shooting studio; a student checkout center with a wide range of still photography and film cameras, professional lights and sound recording equipment; a professionally staffed graphics lab located in the same building that provides student with digital services on several high-tech imaging devices; and individual graduate M.F.A. studios.

- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in photography and film (p. 364)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in photography and film

Program accreditation
National Association of Schools of Art and Design

Program goal

The mission of the M.F.A. in Fine Arts with a concentration in photography and film is to facilitate a comprehensive, advanced, intellectual and artistic understanding and use of the mediums of photography and filmmaking. The specific goals of the program are as follows: to foster a climate that inspires creativity, intellectual curiosity, freedom of expression and critical thinking; to attract and sustain a faculty of the highest quality by providing an environment conducive to their achieving and maintaining national and international stature; and to attract highly artistic and intelligent individuals interested in advanced study of the medium.

Student learning outcomes

1. Students will demonstrate a familiarity with contemporary critical theory and an ability to apply and investigate those ideas in their work.
2. Students will gain and display advanced skills in conceptual and technical use of the medium.
3. Students will be able to create photographs and films that display an advanced level of intelligence and artistic vision.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- A portfolio is required for admission to this program. See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the requirements listed on the website above.

Degree requirements

The advanced study of photography and film is both broad and varied. Therefore, the program's requirements are flexible and determined by the needs of each student on an individual basis. There are, however, a few definite requirements. In addition to general VCU Graduate School graduation requirements (p. 31), on completion of the program, students must have knowledge of contemporary art history, a more in-depth knowledge of the history of their disciplines and an understanding of the critical dialogue that is connected with their medium. Courses are suggested for students to meet these requirements, based on their backgrounds.

Curriculum requirements

Course	Title	Hours
Take 24 credits in the following:		24
PHTO 601	Photographic Studio (3 or 6 credit hours, may be repeated)	
Take nine credits in the following:		9
PHTO 621	Research in Photography and Film (3 or 6 credit hours, may be repeated)	
Take 12 credits in the following:		12
PHTO 690	Seminar in Photography and Film (3 or 6 credit hours, may be repeated)	
PHTO 699	Graduate Exhibition (1 or 3 credit hours, may be repeated)	3

Select 12 credits in approved electives from the list below.	12
Total Hours	60

Approved electives
(other courses maybe approved by department upon request)

Course	Title	Hours
ARTS 601 & ARTS 602	Seminar in Art and Seminar in Art	6
CRAF 690	Graduate Seminar	1,3
ENGL 671	Film and Television Scripts	3
GSWS 691	Topics in Gender, Sexuality and Women's Studies	1-3
KINE 690	Graduate Seminar (with permission of graduate adviser)	4
KINE 695	Advanced Sound	3
PAPR 525	Issues in Contemporary Visual Arts	3
PAPR 527 & PAPR 528	Art and Critical Theory and Art and Critical Theory	6
PAPR 591	Topics in Painting and Printmaking	1-4
PAPR 615	Graduate Printmaking	3,6
PAPR 690	Graduate Seminar	1-3
PHTO 692	Independent Study in Photography and Film	1-3
PHTO 693	Fieldwork, Internship	3,6
PHTO 699	Graduate Exhibition	1,3
SCPT 591	Topics in Sculpture	1-4
SCPT 690	Graduate Seminar	1,4
THEA 603	Dramatic Literature and Theory	3
THEA 604	Modern Theatre: Theory and Practice	3
THEA 661 & THEA 662	Graduate Direction and Graduate Direction	6
THEA 791	Seminar in Special Issues in Theatre	1-3

Total graduate credit hours required (minimum) 60

Graduate program director
Paul B. Thulin
Assistant professor and director of graduate studies
pbthulin@vcu.edu
(804) 828-6056

Additional contact
Sasha A. Waters Freyer
Associate professor and chair, Department of Photography and Film
swfreyer@vcu.edu (swatersfreye@vcu.edu)
(804) 828-2162

Program website: arts.vcu.edu/photofilm (http://arts.vcu.edu/photofilm)

Department of Sculpture and Extended Media

Matt King
Associate professor and chair

arts.vcu.edu/sculpture (http://arts.vcu.edu/sculpture)

The Department of Sculpture and Extended Media's eight full-time faculty members and various part-time and technical faculty represent a spectrum of directions and philosophical attitudes. Faculty interests range from formal to conceptual, from the concrete to the evanescent. This breadth of interests is presented to students and contributes to the comprehensive nature of the department. Students are not only exposed to traditional sculpture media, but encouraged to explore technology's parameters and to pursue interdisciplinary activity.

The department encourages sculpture students to broaden their experience in other areas. By promoting a curriculum that encourages students to take a wide range of courses throughout the university, faculty stress links between art, science, the humanities and the world. As a consequence, sculpture students have rich, productive associations with professors in many fields.

Sculpture students are challenged to exploit their full potential by questioning notions of contemporary art. The goal is to provide students with the vocabulary, the seeds of discernment and the skills of both analysis and synthesis in order to become participants in the dialogue of our time. All of this takes place in an environment of high expectation regarding self-motivation, intellectual capacity and responsibility.

The sculpture program is housed in a state-of-the-art facility. Sculpture majors are provided with semi-private, locked studio spaces and are given time, support and encouragement to pursue their independently determined goals.

- Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in sculpture (p. 366)

Fine Arts, Master of Fine Arts (M.F.A.) with a concentration in sculpture

Program accreditation
National Association of Schools of Art and Design

Program goal

Formal and informal contact with faculty is designed into the program. Along with the Department of Sculpture's faculty, graduate students are exposed to a vigorous visiting artist schedule. Through studio reviews, seminars and research, students are expected to build an awareness of contemporary and historical definitions of art that will influence their creative work. In addition to their own investigations, graduate students participate in and contribute to the undergraduate program.

While the graduate program is generally a two-year, four-semester in-residence program, students are expected to continue studio pursuits either on campus or at an alternative site throughout the calendar year.

Student learning outcomes

1. Define work in relation to history
2. Take full advantage program resources
3. Develop knowledge of equipment and techniques
4. Develop professional practices

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Jan 15	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the requirements listed on the website above. Additionally:

1. Applicants should hold a baccalaureate degree from an accredited institution.
2. It is expected that applicants will have a 3.0 (B) average on the last 60 semester hours of undergraduate work.
3. A portfolio review is required. A personal interview is encouraged.
4. Applicants must have completed a minimum of 36 credit hours of art at the undergraduate level.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.F.A. in Fine Arts with a concentration in sculpture requires 60 credit hours and is usually completed in two years of full-time study. Most of these credit hours are in studio areas and are augmented by related courses in specialized academic fields. A graduate seminar meets weekly and addresses topics related to contemporary art and theory. Two required semesters of art and critical theory are presented in a course that surveys the major themes of contemporary art criticism.

Graduate students meet with individual committees composed of three faculty members. Each committee and student conducts an ongoing dialogue and critique. At the end of the second semester, students discuss their work at a candidacy critique comprising their committee and additional faculty members. M.F.A. recipients mount a comprehensive exhibition of their work at the university's Anderson Gallery at the successful conclusion of the program's second year.

The Master of Fine Arts program is based on intensive studio practice at an advanced level in the area of sculpture. The program is highly selective and is presently limited to 15 participants.

Curriculum requirements

Course	Title	Hours
Take 16 credits in the following course:		16
SCPT 500	Graduate Sculpture	
Take 16 credits in the following course:		16
SCPT 600	Graduate Sculpture	
Take 16 credits in the following course:		16
SCPT 690	Graduate Seminar [1]	
Electives [2]		12
Total Hours		60

[1] Enrollment in the graduate seminar is mandatory for the duration of the student's study in the program.

[2] Students may select any graduate-level course within the university with the approval of their adviser.

Total graduate credit hours required (minimum) 60

Typical plan of study

Semester 1		Hours
SCPT 500	Graduate Sculpture	4
SCPT 600	Graduate Sculpture	4
SCPT 690	Graduate Seminar [1]	4
Elective [2]		3
	Term Hours:	15
Semester 2		
SCPT 500	Graduate Sculpture	4
SCPT 600	Graduate Sculpture	4
SCPT 690	Graduate Seminar [1]	4
Elective [2]		3
	Term Hours:	15
Semester 3		
SCPT 500	Graduate Sculpture	4
SCPT 600	Graduate Sculpture	4
SCPT 690	Graduate Seminar [1]	4
Elective [2]		3
	Term Hours:	15
Semester 4		
SCPT 500	Graduate Sculpture	4
SCPT 600	Graduate Sculpture	4
SCPT 690	Graduate Seminar [1]	4
Elective [2]		3
	Term Hours:	15
	Total Hours:	60

1

Enrollment in the graduate seminar is mandatory for the duration of the student's study in the program.

2

Students may select any graduate-level course within the university with the approval of their adviser.

Graduate program director
Carlton R. Newton
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(804) 828-1511

Program website: arts.vcu.edu/sculpture (http://arts.vcu.edu/sculpture)

Department of Theatre

Sharon Ott
Associate professor and chair

arts.vcu.edu/theatre (http://arts.vcu.edu/theatre)

The mission of the Department of Theatre is to educate and train students as theatre professionals and/or academicians in the field of performance, design/technology or theatre pedagogy.

In fulfilling its mission, the Department of Theatre provides students with the professional and cultural foundations essential for achieving the highest standards of the art. The department offers three degrees — a Bachelor of Arts, a Bachelor of Fine Arts and a Master of Fine Arts — to which applicants are admitted based on demonstration of ability, genuine interest determined during an interview, and audition and/or portfolio presentation.

In addition to introductory theatre and acting courses for non-majors, the department also serves students throughout the university with offerings in speech communication.

The Department of Theatre employs 23 faculty and staff and enrolls 230 undergraduate and 40 to 50 full-time graduate students. Theatre VCU produces four mainstage productions and numerous graduate and undergraduate directing projects each year.

- Theatre, Master of Fine Arts (M.F.A.) with a concentration in costume design (p. 368)
- Theatre, Master of Fine Arts (M.F.A.) with a concentration in pedagogy/literature (p. 370)
- Theatre, Master of Fine Arts (M.F.A.) with a concentration in pedagogy/performance (p. 372)
- Theatre, Master of Fine Arts (M.F.A.) with a concentration in stage design/technical theatre (p. 375)

Theatre, Master of Fine Arts (M.F.A.) with a concentration in costume design

Program accreditation
National Association of Schools of Theatre

Program goal

The M.F.A. in Theatre offers concentrations in stage design/technical theatre and costume design, which comprise the professional option, and in literature and performance, which make up the pedagogy option. Focus areas in pedagogy include movement, performance, and voice and speech.

Student learning outcomes

The M.F.A. degree prepares students to either enter the professional field of design or to teach at the college or university level. Students will demonstrate theoretical and practical knowledge in their areas of focus, as well as in the core courses in history, literature and theory; and in teaching performance or production. They will be evaluated on their ability to teach undergraduates, a final thesis project and approval of a professional-quality design, presentation or publishable article.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 15 (suggested)	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must possess a bachelor's degree (theatre preferred). Students must present a portfolio of design work (both project and realized designs) as part of their application to the program. Professional experience will be considered. The program provides preparation for early to midcareer professionals to enter the field of either professional design or teaching theatre at the college/university level.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to take 60 credit hours of graduate-level course work distributed among core courses, area of concentration and electives, including special topics courses. The program is usually completed within two to three years.

Costume design concentration

The costume design concentration's degree requirements include 12 credit hours in core courses, 12 to 18 credit hours in (level-appropriate) design studio and three to six credit hours of thesis/thesis project. The balance of credit hours will be in approved electives, which may include additional practica, research and production, or professional internships. Students will take practical courses and assist faculty in teaching and design projects. They may be advised to take additional history or drawing courses to ensure that they possess the background required for advanced design projects. Their design skills and professional preparation will be evaluated by the faculty through portfolio presentations and participation at professional conferences.

Curriculum requirements

Course	Title	Hours
Core curriculum		
THEA 509	Theatre History and Historiography	3
THEA 510	Theatre Historiography	3
THEA 603	Dramatic Literature and Theory	3
THEA 604	Modern Theatre: Theory and Practice	3
Concentration requirements		
Select 12-18 credits from the following:		12-18
THEA 508	Scene Painting	
THEA 593	Professional Internship	
THEA 621	Problems in Costume Design	
THEA 622	Problems in Costume Design	
THEA 630	Production	
THEA 640	Advanced Theatre Projects	
THEA 641	Advanced Theatre Projects	
Electives		
Select 24-30 credits from the following recommended electives: [1]		24-30
THEA 605 & THEA 606	Advanced Studies in Stage Design and Advanced Studies in Stage Design	
THEA 651	Individual Study in Graduate Design	
THEA 791	Seminar in Special Issues in Theatre	
Thesis or thesis project		
THEA 699	Creative Project Evaluation	3-6
or THEA 799	Thesis	
Total Hours		51-66

[1] Some courses may be repeated with permission of the graduate program director.

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		Hours
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 621	Problems in Costume Design	3
THEA 630	Production	3
Elective		3
	Term Hours:	12
Semester 2		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 622	Problems in Costume Design	3
THEA 641	Advanced Theatre Projects	3
Elective		3
	Term Hours:	12
Semester 3		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 508	Scene Painting	3
THEA 621	Problems in Costume Design	3
THEA 651	Individual Study in Graduate Design	3
	Term Hours:	12
Semester 4		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 508	Scene Painting	3
THEA 622	Problems in Costume Design	3
THEA 630	Production	3
	Term Hours:	12
Semester 5		
THEA 640	Advanced Theatre Projects	3
THEA 698	Creative Project	3
Elective (special topics or art history)		3
	Term Hours:	9
Semester 6		
THEA 593	Professional Internship	3
THEA 641	Advanced Theatre Projects	3
THEA 699	Creative Project Evaluation	3
	Term Hours:	9
	Total Hours:	66

Graduate program director
Noreen C. Barnes, Ph.D.
Director of graduate studies, Department of Theatre
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(804) 827-1677

Additional contacts
Aaron D. Anderson, Ph.D.
Associate chair, Department of Theatre
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Toni-Leslie James
Head of costume design
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(804) 828-1514

Program website: arts.vcu.edu/theatre (http://arts.vcu.edu/theatre)

Theatre, Master of Fine Arts (M.F.A.) with a concentration in pedagogy/literature

Program accreditation
National Association of Schools of Theatre

Program goal

The M.F.A. in Theatre offers concentrations in stage design/technical theatre and costume design, which comprise the professional option, and in literature and performance, which make up the pedagogy option. Focus areas in pedagogy include movement, performance, and voice and speech.

Student learning outcomes

The M.F.A. degree prepares students to either enter the professional field of design or to teach at the college or university level. Students will demonstrate theoretical and practical knowledge in their areas of focus, as well as in the core courses in history, literature and theory; and in teaching performance or production. They will be evaluated on their ability to teach undergraduates, a final thesis project and approval of a professional-quality design, presentation or publishable article.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 15 (suggested)	

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.
- Audition required.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must possess a bachelor's degree (theatre preferred). Students must present a portfolio of design work (both project and realized designs) as part of their application to the program. Professional experience will be considered. The program provides preparation for early to midcareer professionals to enter the field of either professional design or teaching theatre at the college/university level.

Degree requirements

In addition to general Graduate School graduation requirements (p. 31), students are required to take 60 credit hours of graduate-level course work distributed among core courses, area of concentration and electives, including special topics courses. Students will also be evaluated on performance projects, production work and teaching. The program is usually completed within two to three years.

Pedagogy/literature concentration

Requirements of the pedagogy/literature concentration include 18 credit hours in core courses (including theatre pedagogy and production), 12 credit hours in the focus area and six credit hours of thesis/thesis project. The balance of credit hours will be in approved electives, which may include additional practica, research and production, or teaching internships. Students take four to six courses in their areas of concentration and additional related courses in performance (or in MATX/English courses). Students will take practical courses and assist faculty in teaching. Their teaching effectiveness will be evaluated by area faculty. Students will also have assignments as dramaturges for both departmental and outside productions.

Curriculum requirements

Course	Title	Hours
Core curriculum		
THEA 509	Theatre History and Historiography	3
THEA 510	Theatre Historiography	3
THEA 603	Dramatic Literature and Theory	3
THEA 604	Modern Theatre: Theory and Practice	3
THEA 619	Theatre Pedagogy	3
THEA 640	Advanced Theatre Projects	3
Concentration requirements		
Select 12-15 credits from the following:		12-15
THEA 640	Advanced Theatre Projects	
THEA 641	Advanced Theatre Projects	
THEA 696	Dramaturgy	
THEA 697	Research and Special Problems in Theatre	
Electives		
Select 24-30 credits from the following recommended electives: [1]		24-30
MATX 601	Texts and Textuality	
THEA 593	Professional Internship	
THEA 623	Advanced Studies in Modern Drama	
THEA 624	Advanced Studies in Modern Drama	
THEA 630	Production	
THEA 641	Advanced Theatre Projects	
THEA 791	Seminar in Special Issues in Theatre	
Thesis or thesis project		
Select one of the following:		6
THEA 699	Creative Project Evaluation	
THEA 799	Thesis	
Total Hours		60-69

[1]

Students are encouraged to take electives in all areas of pedagogy, in addition to their focus area. Some courses may be repeated with permission of the graduate program director.

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		Hours
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 640	Advanced Theatre Projects	3
THEA 693	Colloquium and Practical Training [1]	3
THEA 697	Research and Special Problems in Theatre	3
Elective		3
	Term Hours:	15
Semester 2		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 593	Professional Internship	3
THEA 641	Advanced Theatre Projects	3
THEA 696	Dramaturgy	3
Elective		3
	Term Hours:	15
Summer		
THEA 619	Theatre Pedagogy (Optional)	3-6
	Term Hours:	3-6
Semester 3		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 619	Theatre Pedagogy	3
THEA 693	Colloquium and Practical Training	6
Elective		3
	Term Hours:	15
Semester 4		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 698 or THEA 699 or THEA 799	Creative Project or Creative Project Evaluation or Thesis	3
Electives		6
	Term Hours:	12
	Total Hours:	60-63

[1]

Observation/assisting in undergraduate theatre history/dramatic literature course.

Graduate program director
Noreen C. Barnes, Ph.D.
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Additional contact
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Associate chair, Department of Theatre
adanderson@vcu.edu
(804) 828-2697

Theatre, Master of Fine Arts (M.F.A.) with a concentration in pedagogy/performance

Program accreditation
National Association of Schools of Theatre

Program goal

The M.F.A. in Theatre offers concentrations in stage design/technical theatre and costume design, which comprise the professional option, and in literature and performance, which make up the pedagogy option. Focus areas in pedagogy include movement, performance, and voice and speech.

Student learning outcomes

The M.F.A. degree prepares students to either enter the professional field of design or to teach at the college or university level. Students will demonstrate theoretical and practical knowledge in their areas of focus, as well as in the core courses in history, literature and theory; and in teaching performance or production. They will be evaluated on their ability to teach undergraduates, a final thesis project and approval of a professional-quality design, presentation or publishable article.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 15 (suggested)	
	Spring	Nov 15 (suggested)	

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.
- Audition required.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must possess a bachelor's degree (theatre preferred). Students must present a portfolio of design work (both project and realized designs) as part of their application to the program. Professional experience will be considered. The program provides preparation for early to midcareer professionals to enter the field of either professional design or teaching theatre at the college/university level.

Degree requirements

In addition to general Graduate School graduation requirements (p. 31), students are required to take 60 credit hours of graduate-level course work distributed among core courses, area of concentration and electives, including special topics courses. Students will also be evaluated on performance projects, production work and teaching. The program is usually completed within two to three years.

Pedagogy/performance concentration

Requirements of the pedagogy/performance concentration include 18 credit hours in core courses (including theatre pedagogy and production), 12 to 15 credit hours in a focus area (voice and speech, performance, or movement) and six credit hours of thesis/thesis project. The remainder of the program consists of approved elective courses. Students will take practical courses and assist faculty in teaching. Their teaching effectiveness will be evaluated by area faculty.

Curriculum requirements

Course	Title	Hours
Core curriculum		
THEA 509	Theatre History and Historiography	3
THEA 510	Theatre Historiography	3
THEA 603	Dramatic Literature and Theory	3
THEA 604	Modern Theatre: Theory and Practice	3
THEA 619	Theatre Pedagogy	3
THEA 640	Advanced Theatre Projects	3
Concentration requirements		
Select 12-15 credits from the following:		12-15
THEA 501	Basic Voice and Speech	
THEA 502	Basic Voice and Speech	
THEA 513 & THEA 514	Graduate Acting and Graduate Acting	
THEA 517	Physical Acting	
THEA 518	The Pedagogy of Movement	
THEA 601	Advanced Voice and Speech Pedagogy: Shakespeare	
THEA 602	Advanced Topics in Voice and Speech Pedagogy	
THEA 613	Advanced Problems in Acting	
THEA 614	Pedagogy of Acting	

THEA 617	Special Topics in Physical Acting	
THEA 618	Special Topics in Choreography and Directing	
THEA 640	Advanced Theatre Projects	
THEA 641	Advanced Theatre Projects	
THEA 661 & THEA 662	Graduate Direction and Graduate Direction	
THEA 693	Colloquium and Practical Training	
Electives		
Select 24-30 credits from the following recommended electives: [1]		24-30
THEA 593	Professional Internship	
THEA 630	Production	
THEA 641	Advanced Theatre Projects	
THEA 693	Colloquium and Practical Training	
THEA 697	Research and Special Problems in Theatre	
THEA 791	Seminar in Special Issues in Theatre	
Thesis or thesis project		
Select one of the following:		6
THEA 698	Creative Project	
THEA 699	Creative Project Evaluation	
THEA 799	Thesis	
Total Hours		60-69

[1]

Students are encouraged to take electives in all areas of pedagogy, in addition to their focus area. Some courses may be repeated with permission of the graduate program director.

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		**Hours**
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 501	Basic Voice and Speech	3
THEA 640	Advanced Theatre Projects	3
THEA 693	Colloquium and Practical Training [1]	3
Elective		3
	Term Hours:	15
Semester 2		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 502	Basic Voice and Speech	3
THEA 641	Advanced Theatre Projects	3
THEA 693	Colloquium and Practical Training [1]	3
Elective		3
	Term Hours:	15
Summer		
Select one of the following (optional)		3-6
THEA 619	Theatre Pedagogy	3
Core requirements		3-6
	Term Hours:	3-6
Semester 3		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 601	Advanced Voice and Speech Pedagogy: Shakespeare	3
THEA 619	Theatre Pedagogy	3
Practicum or professional internship		3-6
Elective		3
	Term Hours:	15-18
Semester 4		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 602	Advanced Topics in Voice and Speech Pedagogy	3
THEA 698 or THEA 699 or THEA 799	Creative Project or Creative Project Evaluation or Thesis	3
Elective		3
	Term Hours:	12
	Total Hours:	60-66

[1]

Observation/assisting in undergraduate theatre history/dramatic literature course.

Graduate program director

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Additional contact

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Theatre, Master of Fine Arts (M.F.A.) with a concentration in stage design/technical theatre

Program accreditation
National Association of Schools of Theatre

Program goal

The M.F.A. in Theatre offers concentrations in stage design/technical theatre and costume design, which comprise the professional option, and in literature and performance, which make up the pedagogy option. Focus areas in pedagogy include movement, performance, and voice and speech.

Student learning outcomes

The M.F.A. degree prepares students to either enter the professional field of design or to teach at the college or university level. Students will demonstrate theoretical and practical knowledge in their areas of focus, as well as in the core courses in history, literature and theory; and in teaching performance or production. They will be evaluated on their ability to teach undergraduates, a final thesis project and approval of a professional-quality design, presentation or publishable article.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 15 (suggested)	None

Special requirements

- See arts.vcu.edu/admissions/how-to-apply (http://arts.vcu.edu/admissions/how-to-apply) for details on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must possess a bachelor's degree (theatre preferred). Students must present a portfolio of design work (both project and realized designs) as part of their application to the program. Professional experience will be considered. The program provides preparation for early to midcareer professionals to enter the field of either professional design or teaching theatre at the college/university level.

Degree requirements

In addition to general Graduate School graduation requirements (p. 31), students are required to take 60 credit hours of graduate-level course work distributed among core courses, area of concentration and electives, including special topics courses. The program is usually completed within two to three years.

Stage design/technical theatre concentration

The stage design/technical theatre concentration's degree requirements include 12 credit hours in core courses, 12 to 18 credit hours in (level-appropriate) design studio and three to six credit hours of thesis/thesis project. The balance of credit hours will be in approved electives, which may include additional practica, research and production, or professional internships. Students will take practical courses and assist faculty in teaching and design projects. They may be advised to take additional history or drawing courses to ensure that they possess the background required for advanced design projects. Their design skills and professional preparation will be evaluated by the faculty through portfolio presentations and participation at professional conferences.

Curriculum requirements

Course	Title	Hours
Core curriculum		
THEA 509	Theatre History and Historiography	3
THEA 510	Theatre Historiography	3
THEA 603	Dramatic Literature and Theory	3
THEA 604	Modern Theatre: Theory and Practice	3
Concentration requirements		
Select 12-18 credits from the following:		12-18
THEA 505 & THEA 506	Advanced Scene Design III and Advanced Scene Design IV	
THEA 508	Scene Painting	
THEA 593	Professional Internship	
THEA 605 & THEA 606	Advanced Studies in Stage Design and Advanced Studies in Stage Design	
THEA 630	Production	
THEA 640	Advanced Theatre Projects	
THEA 641	Advanced Theatre Projects	
THEA 651	Individual Study in Graduate Design	
Electives		
Select 24-30 of the following recommended electives: [1]		24-30
THEA 621 & THEA 622	Problems in Costume Design and Problems in Costume Design	
THEA 651	Individual Study in Graduate Design	
THEA 791	Seminar in Special Issues in Theatre	
Thesis or thesis project		
THEA 699	Creative Project Evaluation	3-6
or THEA 799	Thesis	

[1]

Some courses may be repeated with permission of the graduate program director.

Total graduate credit hours required (minimum) 60

Sample plan of study

Semester 1		Hours
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 505	Advanced Scene Design III	3
THEA 630	Production	3
Elective		3
	Term Hours:	12
Semester 2		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 506	Advanced Scene Design IV	3
THEA 508	Scene Painting	3
THEA 641	Advanced Theatre Projects	3
	Term Hours:	12
Semester 3		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 508	Scene Painting	3
THEA 605	Advanced Studies in Stage Design	3
THEA 651	Individual Study in Graduate Design	3
	Term Hours:	12
Semester 4		
THEA 509 or THEA 510 or THEA 603 or THEA 604	Theatre History and Historiography or Theatre Historiography or Dramatic Literature and Theory or Modern Theatre: Theory and Practice	3
THEA 508	Scene Painting	3
THEA 606	Advanced Studies in Stage Design	3
THEA 630	Production	3
	Term Hours:	12
Semester 5		
THEA 640	Advanced Theatre Projects	3
THEA 698	Creative Project	3
Elective (special topics or art history)		3
	Term Hours:	9
Semester 6		
THEA 593	Professional Internship	3
THEA 641	Advanced Theatre Projects	3
THEA 699 or THEA 799	Creative Project Evaluation or Thesis	3
	Term Hours:	9
	Total Hours:	66

Graduate program director

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Program website: arts.vcu.edu/theatre (http://arts.vcu.edu/theatre)

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Founded in 1998 as a collaboration between the Qatar Foundation for Education, Science and Community Development and Virginia Commonwealth University School of the Arts, the School of the Arts in Qatar offers the baccalaureate degrees in art history, fashion design, graphic design, interior design, and painting and printmaking, as well as a Master of Fine Art in Design. Its purpose is to provide special educational opportunities preparing graduates for leadership roles in the design professions and art history. Courses emulate those offered on VCU's Monroe Park Campus. Graduates are prepared for exciting careers in these growing fields.

VCU School of the Arts obtained the appropriate approvals from the VCU Board of Visitors and the State Council of Higher Education for Virginia and admitted the first class to what would become VCU School of the Arts in Qatar in fall 1998. SCHEV approved the request in April 2001 and forwarded its recommendation to the governor and General Assembly. The 2002 General Assembly adopted legislation authorizing VCU to establish a campus in Qatar.

- Design, Master of Fine Arts (M.F.A.) with a concentration in design studies [VCUQatar Campus] (p. 377)

Design, Master of Fine Arts (M.F.A.) with a concentration in design studies [VCUQatar Campus]

Program accreditation
National Association of Schools of Art and Design

Mission statement

The M.F.A. in Design with a concentration in design studies defines and inhabits an area between design disciplines. The purpose of the program is to produce designers who are experts at negotiating and utilizing elements of many different fields to construct new tailored experiences.

Tomorrow's designers must be able to understand their audiences, collaborators and patrons in original and authentic ways. Global cultures already experience design in a singular fashion. The practices at VCUQ combine graphics, interaction, engineering, systems, architecture, fashion and product design into a merged experience. Designers who are able to work outside their individual discipline will be at an advantage. The designers of the future will need to navigate between forms of practice, combining elements and skills to create new products, visuals, environments and interactions.

VCUQ is looking for creative, motivated, hardworking, self-directed individuals willing to engage with challenging topics. The program sets high demands on its students, requiring them to familiarize and grasp the myriad of variables involved in meaningful design, while simultaneously having the discipline and rigor to formulate their own assessment of what being a designer — in all its guises — entails today.

Students in this program should be able to question; be open to explore and experiment; stay true to ethical foundations; lead and be bold, while being open and flexible to adjust to shifting paradigms. The school strives to expose students to a variety of tools, materials and methods, while providing the theoretical background and research methodologies that will allow each student to develop their own unique ideas.

The M.F.A. in Design with a concentration in design studies celebrates the amorphous notion of what is called "empirical vagueness," a term that encapsulates the simultaneously analytical, yet intuitive, fashion in which a design endeavor is developed. Students, alumni and faculty all play a role in exploring and fostering this as an essential, if inherently open-ended, calling.

Program goals

1. **Creative leadership:** Students will achieve mastery in creative leadership, with the skills and knowledge needed to achieve success as design professionals and entrepreneurs, educators, and researchers, and they will be able to creatively engage with the broad design community to bring added value to the regional economy, society and culture.
2. **Integrated research:** Students will integrate practice and theory to ensure the highest level of critical knowledge and to make meaningful contributions to pedagogy and teaching in the design disciplines.

The program provides increased focus and visibility for individual and collaborative research activity that has an applied focus.

3. **Interdisciplinary emphasis:** Students will achieve high levels of creativity, literacy and knowledge across the design disciplines.
4. **Community impact:** Students will engage and raise social awareness.
5. **Career development:** The program will develop graduates with skills and knowledge to make meaningful contributions to pedagogy and teaching in the design disciplines. It also will provide opportunities that encourage students to engage and present their work in connection with the professional world.

Student learning outcomes

1. Students will demonstrate the ability to effectively communicate in speech about their research and studio activities.
2. Students will demonstrate the ability to effectively communicate in writing about their research and studio activities.
3. Students will demonstrate the ability to practice lifelong learning by dealing with new forms of design practice and other changes in the discipline.
4. Students will demonstrate the ability to integrate ideas from historical, social and cultural movements; from policies and theories; and from the dynamics of historical, social and cultural change.
5. Students will demonstrate the ability to apply appropriate technologies to projects in their field.
6. Students will demonstrate the ability to synthesize knowledge from different disciplines to solve design problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Student Handbook: qatar.vcu.edu/images/uploads/documents/MFA-ProgramHandbook.pdf (http://qatar.vcu.edu/images/uploads/documents/MFA-ProgramHandbook.pdf)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.F.A.	Fall	Feb 1	TOEFL: 570 (paperbased), 230 (computer-based) or 88 (Internet-based)

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit the following documentation and meet the following requirements:

1. A brief statement of intent that addresses:
   a. The reason for graduate study in design studies
   b. How previous studies and experiences have prepared the applicant for the M.F.A. program
   c. Career objectives and how the M.F.A. program relates to them
2. A digital portfolio of visual or written work that includes:
   a. Samples of relevant work that show creative thinking, idea development and visualization skills
   b. Works that support the ideas shared in the statement of intent
   c. No more than 20 individual works
3. A prepared presentation (for individuals selected for the interview)
4. A resume that highlights the applicant's previous experiences and studies as they relate to graduate study at VCUQatar
5. Three letters of recommendation from former professors, teachers, mentors or supervisors familiar with the applicant's academic and/or professional ability and aptitude toward graduate study
   Note: In the VCUQatar portfolio system, applicants are able to send an online form to each recommender. Alternatively, the applicant

can deliver a printed recommendation letter to the Admissions Office. Download a recommendation template to use.

6. Official academic transcripts (secondary and postsecondary) for all university studies
   a. Submit officially certified copies of all academic diplomas, certificates, national and other major examination results. Transcripts in languages other than English must also include a certified English translation. Transcript(s) must be properly sealed and stamped by the issuing institution and must be delivered to VCUQatar Admissions Office either by hand or post.
   b. The address on the official online application Confirmation Page will list a Richmond, VA address for supporting materials, but all documents should be sent to the VCUQatar Admissions Office.
7. For applicants whose first language is a language other than English, an English language proficiency test with the following minimum requirements:< >TOEFL: 570 (paper-based), 230 (computer-based) or 88 (Internet-based)IELTS: 6.5Note: Test scores must be sent electronically by the testing center. The TOEFL code for admission testing to VCUQatar is 5570. There is no code for IELTS.
8. The English language proficiency tests and standardized testing (TOEFL, SAT, ACT and IELTS) can be taken at the QF Test Center in Education City. Please visit the test center's website to see the latest dates.
9. A legible copy of the applicant's passports uploaded using the online application
10. A non-refundable application fee of $50 (US) or QAR183 for each M.F.A. application (This can be paid by credit card when submitting the online application form or at the VCUQatar's Cashier Office.)

Important reminders

1. All admission supporting materials (excluding exam scores and transcripts) must be uploaded electronically using the VCUQatar online application process at https://ssb.vcu.edu.
2. Original, official TOEFL/IELTS score reports must be sent to VCUQatar via courier or delivered in person to the Admissions Office.
3. Applicants must ensure that letters of recommendation reach the office using either the VCUQatar portfolio application system or the downloadable template.
4. Only complete applications will be considered for assessment.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must meet the following minimum requirements:

1. Total of 60 credit hours
2. Publication/documentation as specified
3. Qualification for degree candidacy
4. Thesis and final research project, exhibition and oral defense

Curriculum requirements

Course	Title	Hours
DESI 510	Materials and Methods Studio	3
DESI 511	Studio in Digital Design and Fabrication Technology	3
DESI 512	Studio in Visual Communications	3
DESI 520	Design Research Methodologies	3
DESI 601	Interdisciplinary Design Seminar	3
DESI 605	Design Strategies and Ethics for Business	3
DESI 611	Design Studio One	6
DESI 612	Design Studio Two	6
DESI 613	Design Studio Three	6
DESI 620	Design Thesis Research and Formulation	3
DESI 621	Design Research Studio: Leadership and Entrepreneurship	3
DESI 630	Teaching Practicum in Design	3
or DESI 631	Design Internship	
DESI 690	Thesis Studio	9
Approved studio electives [1]		6
Total Hours		60

1

Approved electives (six credit hours) may be selected from a variety of 500- and 600-level courses offered at VCUQatar and VCU in Richmond. In addition, students are encouraged to enroll in 500- and 600-level elective courses offered by other accredited universities within Hamad bin Khalifa University in Qatar or any other internationally accredited university. Before taking a course outside of VCU, the student must submit a course syllabus to the M.F.A. in Design program director for approval.

Total graduate credit hours required (minimum) 60

Sample plan of study

Probationary course work may be required prior to gaining full admission to the program. The amount and type of undergraduate course work will be determined at the time of application, and no graduate credit hours will be awarded for this probationary course work. The decision to grant full admission will be based upon successful completion of the required course work.

Semester 1		Hours
DESI 511	Studio in Digital Design and Fabrication Technology	3
DESI 520	Design Research Methodologies	3
DESI 601	Interdisciplinary Design Seminar	3
DESI 611	Design Studio One	6
	Term Hours:	15
Semester 2		
DESI 510	Materials and Methods Studio	3
DESI 512	Studio in Visual Communications	3
DESI 612	Design Studio Two	6
Approved studio elective [1]		3
	Term Hours:	15
Semester 3		
DESI 605	Design Strategies and Ethics for Business	3
DESI 613	Design Studio Three	6
DESI 620	Design Thesis Research and Formulation	3
Approved studio elective [1]		3
	Term Hours:	15
Semester 4		
DESI 621	Design Research Studio: Leadership and Entrepreneurship	3

DESI 630 or DESI 631	Teaching Practicum in Design or Design Internship	3
DESI 690	Thesis Studio	9
	Term Hours:	15
	Total Hours:	60

[1]

Approved electives (six credit hours) may be selected from a variety of 500- and 600-level courses offered at VCUQatar and VCU in Richmond. In addition, students are encouraged to enroll in 500- and 600-level elective courses offered by other accredited universities within Hamad bin Khalifa University in Qatar or any other internationally accredited university. Before taking a course outside of VCU, the student must submit a course syllabus to the M.F.A. in Design program director for approval.

Graduate program director
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Program website: qatar.vcu.edu/mfa (http://qatar.vcu.edu/mfa)

SCHOOL OF BUSINESS

A close-knit community within a leading urban, public university, the VCU School of Business enrolls 4,000 students in a wide range of bachelor's, master's, certificate and doctoral programs. The school ranks in the top 5 percent of business schools worldwide due to its accreditation by AACSB International. From its founding in 1937, the school has developed strong connections with the business community in Richmond and beyond, with students actively engaged in internships, corporate projects and learning from executives.

Strategic plan

In 2015-16, the VCU School of Business launched a bold strategic plan, EPIC, to build on its strengths and ensure that the school's students are prepared to thrive in a changing world. As the business landscape grows increasingly complex, companies in every industry need creative solutions. Leaders are seeking to hire graduates who have a solid foundation in their chosen business discipline — combined with the ability to bring fresh thinking and a creative approach to solving problems.

Our vision

Drive the future of business through the power of creativity

Our mission

To be a dynamic hub of business education and research, fueled by creativity and a commitment to preparing students to lead in a complex world

EPIC Pillars

Experiential learning, Problem-solving curricula, Impactful research, Creative culture

The School of Business, its programs and faculty have received national recognition from top publications such as U.S. News & World Report, the Princeton Review, Bloomberg Businessweek, The CEO Magazine and Advertising Age. In 2014, the top-ranked VCU Brandcenter joined the School of Business. Graduates from all programs are welcomed into the VCU Business Alumni Society.

Administration

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Ed Grier
Dean

Kenneth B. Kahn, Ph.D.
Senior associate dean

Jayaraman Vijayakumar, Ph.D.
Associate dean for graduate programs

Shannon K. Mitchell, Ph.D.
Associate dean for undergraduate studies

Nanda K. Rangan, Ph.D.
Associate dean for international and strategic initiatives

Accreditation

The School of Business is accredited by the Association to Advance Collegiate Schools of Business, which accredits programs of professional education in business at the collegiate level. AACSB International accreditation represents the highest standard of achievement for business schools worldwide. Institutions that earn accreditation confirm their commitment to quality and continuous improvement through a rigorous and comprehensive peer review. AACSB International accreditation is the hallmark of excellence in management education.

The School of Business is the first school of business in the nation to gain accreditation from the Accreditation Board for Engineering and Technology for its undergraduate program in information systems.

Financial aid, scholarships and awards

Scholarships and awards

In addition to university scholarships, business students may apply and compete for scholarships awarded through School of Business endowed scholarship funds or through the various School of Business academic programs. For detailed information on scholarships and awards, visit the School of Business website.

Cooperative education and internships

Business students are eligible for the university's cooperative education program. Qualified students placed with an employer will either alternate one semester of full-time study with one semester of full-time work or combine study with part-time work during the same semester. The School of Business also offers internships, allowing advanced students to pursue part-time work assignments with area employers.

Assistantships

The School of Business offers a limited number of graduate assistantships to full-time students for the academic year. For further information, write to the Graduate Studies in Business Office.

Graduate students also are eligible for funds administered under the National Defense Loan and college work-study programs. For further information, write to Director of Financial Aid, Virginia Commonwealth University, Richmond, VA 23284-2526.

Graduate information

Graduate programs

The School of Business offers degree programs leading to the Master of Arts in Economics, Master of Accountancy, Master of Business Administration, Master of Business Administration/Master of Science in Information Systems, Master of Science in Business, Master of Science in Information Systems, Master of Taxation, and the Ph.D. in Business and Pharm.D./M.B.A.

Graduate policies

Enrollment in graduate courses

Students may not enroll in any graduate business courses (except SCMA 500) for credit without first being admitted formally to a graduate degree or graduate certificate program.

Exceptions may be granted by the director of graduate studies in business to students with superior academic records. No credit will be given for graduate classes taken prior to acceptance into a graduate degree program in business or economics unless such an exception has been granted. A form to request such an exception is available from the Graduate Studies in Business Office.

A "graduate transient" classification may be granted to a student in good standing in any graduate school accredited by the Association to Advance Collegiate Schools of Business who wishes to enroll in the School of Business for any one semester or summer session. Students will be required to present certificates of graduate standing but will not have to submit the data normally required for an admission decision. A form is available from the Graduate Studies in Business Office to facilitate transient enrollment.

Transfer credit

A maximum of six semester hours of acceptable graduate credit earned in a degree program at an AACSB-accredited institution may be transferred and applied toward the graduate degree. Acceptance of transfer credit is made at the discretion of the director of graduate studies in business.

All transfer work must be at the A or B grade level. Students must be in good standing both at VCU and at the institution from which the credits were earned. Additionally, students must have had full admission during the time these credits were earned at that college or university. Transfer credit shall not be older than seven years at the time the degree is awarded.

Credit to be earned at other institutions after acceptance in the graduate program must be approved in advance, and approval is granted at the discretion of the director of graduate studies in business. Such work is approved only under unusual circumstances such as job transfers or other extenuating circumstances.

Advising program

All students admitted to graduate programs are assigned advisers. Students are expected to work with their advisers to plan their graduate programs. Each student is required to complete an approved program form and file it with the Graduate Studies in Business Office no later than the end of the first semester in which the student is admitted. The curriculum plan described on the form must be approved by both the adviser and the director of graduate studies in business. Courses taken without approval are taken at the student's own risk.

Students are responsible for knowing and fulfilling all general and specific requirements relating to the completion of their degree programs. Answers to specific questions may be obtained from the Graduate Studies in Business Office, (804) 828-4622.

Change in program or concentrations

Students who wish to change their graduate programs or areas of concentration within the school must make that request in writing to the director of graduate studies in business. The director will advise them of the necessary requirements and whether the change is possible. The student must be in good standing at the time of change.

Notification

The student should notify in writing both the Office of Records and Registration and the Graduate Studies in Business Office, 301 W. Franklin St., Box 844000, Richmond, VA 23284-4000, of any address changes. Students who do not wish to register in any given semester must notify in writing the Graduate Studies in Business Office of their intent not to register and their plans for continuation in the program.

Student appeals

Appeals for exceptions to policies or academic standards may be made in writing to the Graduate Studies in Business Office, School of Business, Virginia Commonwealth University, 301 W. Franklin St., Richmond, VA 23284-4000.

Individual research projects

Various opportunities exist for students to work closely with faculty on individual research projects. Courses in the School of Business numbered 690, 693 and 697 are suitable for this purpose. No more than one research course may be taken as part of a master's program.

Registration in all research courses requires approval of both the student's adviser and the director of graduate studies in business. Forms for this purpose are available upon request from the Graduate Studies in Business Office. Students are expected to seek permission to register in research courses by the end of the semester or summer session preceding the semester or summer session for which registration is desired. The written research report is required to be filed at the Graduate Studies in Business Office no later than the last day of classes of the semester or summer session in which the course is taken.

General requirements for master's degrees

In addition to the general academic regulations stated in the Graduate study (p. 33) section of this bulletin and the regulations listed earlier in this section, master's students in the School of Business are subject to the following requirements:

1. A course for which a passing grade was received cannot be repeated without prior written permission of the director of graduate programs in business. An appeal to the School of Business master's committee is required.
2. Students who satisfy all requirements except the 3.0 average may be allowed to take a maximum of six additional credit hours to raise the average. Students are required to appeal to the School of Business master's committee for permission.
3. A foundation course may be waived by the director of graduate studies in business, based on satisfactory completion of equivalent undergraduate work prior to acceptance in the program. CLEP credit at the B or higher level may be accepted in lieu of foundation courses with permission. The waiver of courses is at the discretion of the School of Business.
4. A maximum of two one-year extensions may be granted by the director of graduate studies in business in the time allowed to complete a degree if satisfactory progress has been demonstrated on the part of the student requesting an extension. For extensions, write to the director of graduate studies in business.
5. Students are not permitted to take undergraduate courses equivalent to foundation courses once they are admitted to the graduate

program without the written permission of the director of graduate studies in business.
6. Grades received for undergraduate courses are not included in the calculation of the cumulative graduate GPA.
7. All students admitted into a program must have earned a bachelor's degree or its equivalent. To be accepted in the graduate program, in addition to other requirements, applicants must be in good standing at the college or university they previously attended.

Business Administration, Certificate in (Post-baccalaureate graduate certificate)

Program accreditation

Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Note: Admission to this program is temporarily suspended.

Program goal

The post-baccalaureate graduate Certificate in Business Administration is designed for professionals with little or no prior business course work who seek an opportunity for advanced study in core business function areas. The certificate provides students the ability to advance their careers while receiving recognition for academic accomplishment in the form of a graduate certificate. By completing the curriculum for the certificate, students will have satisfied the foundation course requirements in the M.B.A. and other master's programs in business.

Student learning outcomes

1. To apply communication skills in new and unfamiliar circumstances in a form that can be readily communicated to entry-level, midlevel and senior-level managers
2. To analyze the ethical dimensions of a business situation, to relate those dimensions to professional ethical standards, and to formulate and defend possible resolutions from the perspective of entry-level managers
3. To select, conceptualize and apply appropriate quantitative techniques or approaches in order to analyze business problems for the purpose of decision-making by entry-level managers
4. To critically evaluate and use accounting and/or other financial information for the purpose of decision-making by entry-level managers

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 1	
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned a baccalaureate degree or its equivalent from an accredited college or university. This program is intended for students with an undergraduate degree in an area other than business management. Other admission requirements include a minimum undergraduate GPA of 2.7 in at least 60 hours of course work. Work experience is preferred.

Note: Admission to this program is temporarily suspended.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core courses. In order to be eligible to receive the certificate, a student must maintain an overall GPA of 3.0. Completion of this graduate certificate program requires 21 credit hours beyond the bachelor's degree. The director of graduate studies in the School of Business may waive up to 12 credit hours based upon equivalent course work completed in the past five years with a minimum grades of B presented. Students who have not completed a precalculus math course may take MATH 151 during enrollment in the certificate program. Successful completion of the graduate certificate program does not guarantee admission to a master's-level program. Students interested in applying at a later date to either the M.B.A. or other master's programs must do so through a separate application process.

Curriculum requirements

Course	Title	Hours
Required courses		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
INFO 661	Information Systems for Managers	3
MGMT 641	Leading People and Organizations	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
Total Hours		21

Total graduate credit hours required (minimum) 21

Graduate program director
Austen Gouldman
Director, graduate programs
Email: gouldmana@vcu.edu
Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business, Doctor of Philosophy (Ph.D.) with a concentration in accounting

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Ph.D. in Business program is designed specifically for individuals intending to fill positions at institutions that require a balance of scholarly training, teaching and practical application of the appropriate field of study. With its small size, the program allows for extensive one-to-one interaction between students and faculty. Three concentrations are offered: accounting, information systems and management.

A basic tenet of the Ph.D. in Business program is that the classic trilogy of research, teaching and service typically invoked in university mission statements is synergistic. The program strives to develop graduates who share this perspective and aspire to well-rounded individual roles within universities, colleges and other learning organizations. For this reason, the program provides instruction in both research and teaching.

Instruction in basic and applied research is the cornerstone of the program. To fulfill the requirements for the degree, students must demonstrate successful completion of prerequisite and advanced courses, comprehensive examinations, and completion and defense of a dissertation. The advanced courses provide coverage in basic theories, methodologies and techniques needed to conduct research. The dissertation demonstrates the student's competence in conducting independent research.

Enhancement of teaching skills is emphasized in the program. It provides students with mentoring and teaching experience. Formal instruction designed to augment student teaching skills is also required. Mentoring involves teaming a student with a faculty member with the goal of augmenting student self-awareness and self-confidence in the classroom. Classroom experience is required to insure that the Ph.D. graduate enters the job market with certifiable teaching experience. The formal courses are designed to provide substantive instruction on teaching the adult learner.

A third aspect of the Ph.D. program is its emphasis on practical application in the area of study for students concentrating in accounting. In accounting emphasis is placed on projects based on real-world experience, and students are encouraged to develop papers around topics that address practical application of accounting concepts.

Student learning outcomes

1. Students will demonstrate the ability to apply general principles of scientific research and methodologies to critically review published research papers.
2. Students will demonstrate the ability to (a) design a research study, (b) select the appropriate methodology and (c) develop the study into a research proposal.
3. Students will demonstrate the ability to identify ethical dilemmas in the major area of study and know how to respond ethically to such issues.
4. Students will demonstrate an understanding of current knowledge in the major area of study.
5. Students will demonstrate the ability to effectively communicate and teach knowledge in the major area of study.
6. Students will demonstrate the ability to develop and conduct research in the major area of study (i.e., complete an independent doctoral-level research project pertaining to the state of the art of the student's major area).

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 1	GMAT

Note: Accounting majors are admitted for the fall of odd-numbered years.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the doctoral program in business must submit an up-to-date resume.

Degree requirements

Upon admission to the Ph.D. program, faculty will evaluate students to determine if they have attained a basic competency level in general business disciplines. Students who have already completed a master's degree in business will likely have met all foundation/prerequisite requirements.

Students who enter the Ph.D. in Business without an education in business will be expected to meet the foundation requirements for the intended concentration area of study as determined by their advisers.

In addition to the VCU Graduate School graduation requirements (p. 31), Ph.D. in Business students must complete a minimum of 53 graduate credit hours, including research tools, concentration and elective course work and a minimum of 12 credit hours of dissertation research. Each student must also take GRAD 602, complete a teaching portfolio and take a written comprehensive examination in the concentration area.

Curriculum requirements

Course	Title	Hours
Research tools course work		
As determined by concentration coordinator		12
Concentration courses		
ACCT 790	Research Methods Seminar	3
ACCT 791	Managerial Accounting Seminar	3
ACCT 792	Financial Accounting Seminar	3
ACCT 794	Behavioral Research Seminar	3
ACCT 795	Auditing Seminar	3
Required course		
GRAD 602	Teaching and Learning in Higher Education	2
Electives		
Four additional courses, as approved by concentration coordinator		12
Dissertation research		
ACCT 898	Dissertation Research (minimum of 12 credit hours)	12
Total Hours		53

Total graduate credit hours required (minimum) 53

Graduate program director
Jayaraman Vijayakumar, Ph.D.
Associate dean, graduate programs
Email: jvijayak@vcu.edu
Phone: (804) 828-4622

Additional contact
Myung S. Park, Ph.D.
Accounting coordinator
Email: mspark@vcu.edu
Phone: (804) 828-3161

Program website: business.vcu.edu/graduate-studies/phd-in-business (http://business.vcu.edu/graduate-studies/phd-in-business)

Business, Doctor of Philosophy (Ph.D.) with a concentration in information systems

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Ph.D. in Business program is designed specifically for individuals intending to fill positions at institutions that require a balance of scholarly training, teaching and practical application of the appropriate field of study. With its small size, the program allows for extensive one-to-one interaction between students and faculty. Three concentrations are offered: accounting, information systems and management.

A basic tenet of the Ph.D. in Business program is that the classic trilogy of research, teaching and service typically invoked in university mission statements is synergistic. The program strives to develop graduates who share this perspective and aspire to well-rounded individual roles within universities, colleges and other learning organizations. For this reason, the program provides instruction in both research and teaching.

Instruction in basic and applied research is the cornerstone of the program. To fulfill the requirements for the degree, students must demonstrate successful completion of prerequisite and advanced courses, comprehensive examinations, and completion and defense of a dissertation. The advanced courses provide coverage in basic theories, methodologies and techniques needed to conduct research. The dissertation demonstrates the student's competence in conducting independent research.

Enhancement of teaching skills is emphasized in the program. It provides students with mentoring and teaching experience. Formal instruction designed to augment student teaching skills is also required. Mentoring involves teaming a student with a faculty member with the goal of augmenting student self-awareness and self-confidence in the classroom. Classroom experience is required to insure that the Ph.D. graduate enters the job market with certifiable teaching experience. The formal courses are designed to provide substantive instruction on teaching the adult learner.

A third aspect of the Ph.D. program is its emphasis on practical application in the area of study for students concentrating in information systems. In information systems, students usually work on projects brought in to the Information Systems Research Institute. These projects focus on user applications and emphasize solutions to specific requirements.

Student learning outcomes

1. Students will demonstrate the ability to apply general principles of scientific research and methodologies to critically review published research papers.
2. Students will demonstrate the ability to
   a. Design a research study
   b. Select the appropriate methodology
   c. Develop the study into a research proposal
3. Students will demonstrate the ability to identify ethical dilemmas in the major area of study and know how to respond ethically to such issues.
4. Students will demonstrate an understanding of current knowledge in the major area of study.
5. Students will demonstrate the ability to effectively communicate and teach knowledge in the major area of study.
6. Students will demonstrate the ability to develop and conduct research in the major area of study (i.e., complete an independent doctoral-level research project pertaining to the state of the art of the student's major area).

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 1	GMAT or GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the doctoral program in business must submit an up-to-date resume.

Degree requirements

Students should at a minimum possess knowledge equivalent to the core courses in the Master of Science in Information Systems program: INFO 610, INFO 620, INFO 630 and INFO 640. Students who do not have knowledge equivalent to these courses, as assessed by the IS department Ph.D. committee, must take one or more of the courses in which they lack knowledge upon admission into the Ph.D. program.

In addition to the VCU Graduate School graduation requirements (p. 31), Ph.D. in Business students must complete a minimum of 53 graduate credit hours, including research core, major content core, elective course work and a minimum of 12 credit hours of dissertation research. Each student must also take GRAD 602, complete a teaching portfolio and take a written comprehensive examination in the concentration area.

Curriculum requirements

Course	Title	Hours
Research core		
BUSN 700	Principles of Scientific Inquiry in Business	3
INFO 701	Qualitative Research in Information Systems	3
INFO 702	Design Science Research and Methods in Information Systems	3
SCMA 643	Applied Multivariate Methods (or equivalent course)	3
A course in quantitative research and methods		3
Concentration courses		12
Complete four of the following IS doctoral seminars:		
INFO 710	Database Systems	
INFO 720	Analysis and Design of Systems	
INFO 730	Information Systems Strategy	
INFO 740	Decision Support and Intelligent Systems	
INFO 750	Information Systems Security	
INFO 760	Knowledge Management	
INFO 790	Doctoral Seminar	
Required course		
GRAD 602	Teaching and Learning in Higher Education	2
Electives [1]		12
Dissertation research		
INFO 898	Dissertation Research in Information Systems (minimum of 12 credit hours)	12

1

Choose four additional courses, of which up to three may be 600-level courses taught by doctoral (or equivalent) faculty, where the selection of such courses is approved by the department's Ph.D. committee or the department Ph.D. adviser. All four may be guided studies, but no more than two guided studies may be supervised by the same faculty member.

Total graduate credit hours required (minimum) 53

Graduate program director
Jayaraman Vijayakumar, Ph.D.
Associate dean, graduate programs
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Additional contact
Victoria Y. Yoon, Ph.D.
Information systems coordinator
Email: vyyoon@vcu.edu
Phone: (804) 828-0672

Program website: business.vcu.edu/graduate-studies/phd-in-business (http://business.vcu.edu/graduate-studies/phd-in-business)

Business, Doctor of Philosophy (Ph.D.) with a concentration in management

Program accreditation
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Program goal

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 1	GMAT or GRE

Note: Management majors are admitted for the fall of odd-numbered years.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the doctoral program in business must submit an up-to-date resume.

Degree requirements

Upon admission to the Ph.D. program, faculty will evaluate students to determine if they have attained a basic competency level in general business disciplines. Students who have already completed a master's degree in business will likely have met all foundation/prerequisite requirements.

Students who enter the Ph.D. in Business without an education in business will be expected to meet the foundation requirements for the intended concentration area of study as determined by their advisers.

In addition to the VCU Graduate School graduation requirements (p. 31), Ph.D. in Business students must complete a minimum of 56 graduate credit hours, including research tools, concentration and elective course work and a minimum of 12 credit hours of dissertation research. Each student must also take GRAD 602, complete a teaching portfolio and take a written comprehensive examination in the concentration area.

Curriculum requirements

Course	Title	Hours
Research tools course work		
As determined by concentration coordinator		12
Concentration courses		
MGMT 737	Seminar in Human Resources	3
MGMT 738	Special Focus in Human Resource Management: ____	3
MGMT 743	Organizing Systems	3
MGMT 746	Cognitive and Emotional Processes in Organizations	3
MGMT 747	Seminar in Human Resources: Macro Foundations	3
MGMT 750	Attitudes and Motivation in Organizations	3
Required course		
GRAD 602	Teaching and Learning in Higher Education	2
Electives		
Four additional courses, as approved by concentration coordinator		12
Dissertation research		
MGMT 898	Dissertation Research in Management (minimum of 12 credit hours)	12
Total Hours		56

Total graduate credit hours required (minimum) 56

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Program website: business.vcu.edu/graduate-studies/phd-in-business (http://business.vcu.edu/graduate-studies/phd-in-business)

Business, Master of Science (M.S.) with a concentration in finance

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The goal of the Master of Science in Business with a concentration in finance program is to train students to take on the quantitatively challenging and highly competitive business environment of the financial industry. Students learn skills to effectively analyze, develop and communicate solutions that take into consideration ethical implications.

Student learning outcomes

1. Graduates will be able to conceptualize and apply quantitative measurement methods, to analyze business problems and to propose solutions.
2. Graduates will be able to analyze a business problem in terms of both quantitative and qualitative aspects, including:
   a. A precise statement of the problem and how it relates to the goals of the firm
   b. A consideration of the ethical, policy and/or practicality limitations on any proposed solution strategy
   c. A statement and consideration of proposed solutions strategies and their implementation within the limitations
   d. A plan for implementation and monitoring of the proposed solution
3. Graduates will be able to analyze the ethical dimensions of a business situation and relate those dimensions to general ethical standards as well as to professional ethical standards.
4. Graduates will be able to express the analytic, quantitative and ethical dimensions of business problems and proposed solutions in a clear and well-organized manner.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

The finance concentration prepares students for financial decision-making positions in corporate, investment, financial and governmental institutions. Courses offered in finance include advanced financial management, investments and security analysis, funds management in financial institutions, international finance, and derivatives.

In addition to the VCU Graduate School graduation requirements (p. 31):

1. All students must have completed a course in calculus prior to attempting graduate business courses. This prerequisite can be met after admission to the program.
2. Students must complete up to four classes (zero to 12 credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waiver of a foundation course may be awarded when a student demonstrates equivalent knowledge, such as completing the required undergraduate equivalent course with a minimum grade of C.

Curriculum requirements

Course	Title	Hours
Prerequisite		
Calculus		
SCMA 212	Differential Calculus and Optimization for Business	3
or SCMA 500	Quantitative Foundation for Decision-making	
Foundation courses		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
Required core courses		
FIRE 621	Cases in Financial Management	3
FIRE 622	Financial Management of Financial Institutions	3
FIRE 623	Financial Management	3
FIRE 635	Investments and Security Analysis	3
FIRE 650	Derivatives	3
Approved electives		
Select four of the following:		12
ACCT 608	Managerial Accounting Concepts	
ECON 617	Financial Markets	
FIRE 626	Risk Management	
FIRE 629	Real Estate Investment Analysis	
FIRE 639	International Finance	
FIRE 654	Short-term Financial Management	
FIRE 657	Current Issues in Investments and Markets	
FIRE 658	Real Estate Finance and Investments	
FIRE 664	Current Issues in Corporate Finance	
FIRE 691	Topics in Finance, Insurance and Real Estate	
FIRE 693	Field Project in Finance, Insurance and Real Estate [1]	
or FIRE 697	Guided Study in Finance, Insurance and Real Estate	
Free electives		
Select one of the following: [2,3]		3
ACCT (any 600-level)		
ECON (any 600-level)		
FIRE (any 600-level)		
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 632	Business Process Engineering	
MGMT 644	International Business Management	
MGMT 655	Entrepreneurship	
MKTG 656	International Marketing	
MKTG 673	Marketing Research	
SCMA 632	Statistical Analysis and Modeling	

SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		45

1

FIRE 693 is recommended for full-time students. The department will work closely with full-time students and prospective employers in order to achieve this goal. Students may not use both FIRE 693 and FIRE 697 toward degree requirements

2

A student may substitute a free elective for one of the FIRE electives with the approval of the director of the concentration in finance.

3

Students may choose any free elective approved by the director of the M.S. program in finance. Students are encouraged to select accounting, economics, math, or statistics courses. These courses are pre-approved electives and therefore do not require further approval.

Total graduate credit hours required (minimum) 45 (30 if prerequisite and all foundation courses are waived)

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Program website: business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-finance (http://business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-finance)

Business, Master of Science (M.S.) with a concentration in global marketing management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Business with a concentration in global marketing management offers students the opportunity to combine their studies in international marketing with contemporary issues in marketing management.

Student learning outcomes

1. Students will evaluate marketing programs.
2. Students will express the analytic, quantitative and ethical dimensions of business problems and proposed solutions in a clear and well-organized manner.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/

graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

The global marketing management concentration provides the opportunity to focus on conceptual and experiential dimensions of marketing management. Students interested in the increasingly global nature of business will be well-suited for this unique graduate degree program. Core courses provide a framework for understanding the role of marketing in diverse organizations. Electives add knowledge in areas of growing importance to the profession and provide the flexibility for students to consider emerging topics in the global marketing environment. Client projects and global applications prepare students for marketing careers. Study abroad is available and encouraged.

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete up to six classes (zero to 18credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waiver of a foundation course may be awarded when a student demonstrates equivalent knowledge, such as completing the required undergraduate equivalent course with a minimum grade of C**.**

Curriculum requirements

Course	Title	Hours
Foundation courses		
0-18 credits; courses may be waived for demonstrated equivalence.		
ACCT 507	Fundamentals of Accounting	
ECON 500	Concepts in Economics	
FIRE 520	Financial Concepts of Management	
SCMA 524	Statistical Fundamentals for Business Management	
Two-course sequence in a foreign language at the undergraduate or graduate level (or demonstrated proficiency) or two approved cross-cultural courses taken at the undergraduate or graduate level		
Core courses		
MGMT 642	Business Policy and Strategy (to be taken in the last semester)	3
MKTG 656	International Marketing	3
MKTG 657	International Market Planning Project	3
MKTG 671	Marketing Management	3
MKTG 673	Marketing Research	3
Marketing electives		
Select three of the following:		9
MKTG 672	Concepts in Consumer Behavior	
MKTG 674	Service Quality Management	
MKTG 675	Digital Marketing	
MKTG 678	Marketing Analytics	
MKTG 691	Topics in Marketing	
Non-marketing electives		
Select two of the following:		6
ECON 609	Advanced International Economics	
FIRE 621	Cases in Financial Management	
FIRE 639	International Finance	
INFO 658	Securing the Internet of Things	
MGMT 644	International Business Management	
MGMT 655	Entrepreneurship	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		30

Total graduate credit hours required (minimum) 48 (30 if all foundation courses are waived)

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Program website: business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-global-marketing-management (http://business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-global-marketing-management)

Business, Master of Science (M.S.) with a concentration in global marketing management with Fudan University [joint degree]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Business with a concentration in global marketing management offers students the opportunity to combine their

studies in international marketing with contemporary issues in marketing management.

Student learning outcomes

1. Students will evaluate marketing programs.
2. Students will express the analytic, quantitative and ethical dimensions of business problems and proposed solutions in a clear and well-organized manner.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business must submit an up-to-date resume.

Degree requirements

Students enrolled in the VCU-Fudan University joint degree program take all required courses at Fudan University in Shanghai and an encouraged practicum course at VCU at the end of the program. The program will be jointly taught by faculty from both VCU and Fudan. The program requires a minimum of 30 credit hours and provides the option to complete a practicum for a total of 33 credits maximum. Upon completion of the requirements, students will receive a Master of Science in Business with a concentration in global marketing management from VCU.

The global marketing management concentration provides the opportunity to focus on conceptual and experiential dimensions of marketing management. Students interested in the increasingly global nature of business will be well-suited for this unique graduate degree program. Core courses provide a framework for understanding the role of marketing in diverse organizations. Electives add knowledge in areas of growing importance to the profession and provide the flexibility for students to consider emerging topics in the global marketing environment. Client projects and global applications prepare students for marketing careers. Study abroad is available and encouraged.

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete up to seven classes (zero to 21 credit hours) of the following preparatory foundation course work taken at Fudan University.

Preparatory foundation courses taken at Fudan University

Course	Title	Hours
Concepts and Issues in Marketing		3
Statistical Elements of Quantitative Management		3
Fundamentals of Accounting		3
Financial Concepts of Management		3
Concepts of Economics		3
Two-course sequence in a foreign language at the undergraduate or graduate level (or demonstrated proficiency) or two approved cross-cultural courses taken at the undergraduate or graduate level		6
Total Hours		21

Curriculum requirements

Course	Title	Hours
Core courses		
MGMT 642	Business Policy and Strategy (to be taken in the last semester)	3
MKTG 656	International Marketing	3
MKTG 657	International Market Planning Project	3
MKTG 671	Marketing Management	3
MKTG 673	Marketing Research	3
Marketing electives		
Select three of the following:		9
MKTG 672	Concepts in Consumer Behavior	
MKTG 674	Service Quality Management	
MKTG 675	Digital Marketing	
MKTG 678	Marketing Analytics	
MKTG 691	Topics in Marketing	
Non-marketing electives		
Select two of the following:		6
ECON 609	Advanced International Economics	
FIRE 621	Cases in Financial Management	
FIRE 639	International Finance	
INFO 658	Securing the Internet of Things	
MGMT 644	International Business Management	
MGMT 655	Entrepreneurship	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		30

Total graduate credit hours required (minimum) 30

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Program website: business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-global-marketing-management (http://business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-global-marketing-management)

Business, Master of Science (M.S.) with a concentration in real estate

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

1. To prepare students for successful careers in real estate and lifelong learning by providing education that is firmly grounded in technology, interdisciplinary teamwork and a global perspective
2. To ensure that students understand and can apply appropriate analytical methodologies and technology to the discipline of real estate
3. To prepare students for professional licensing, certification and/or professional designations

Student learning outcomes

1. Graduates will demonstrate the ability to communicate the qualitative and quantitative dimensions of real estate in a clear and well-organized manner.
2. Graduates will be able to select, conceptualize and apply the appropriate quantitative measurement and analysis to correctly value real estate. Such methods might include an economic and financial analysis of commercial real estate investments, alternative financing structures and/or surveys of recent trends in the securitization of commercial real estate debt and equity markets.
3. Graduates will be able to analyze a real estate problem in terms of:
   a. Development of a precise statement of the problem and how it relates to the goals of the firm and/or client
   b. A consideration of the ethical, policy and/or practical limitations on any proposed solution strategy
   c. Statement and consideration of proposed solutions strategies and their implementation
   d. Formulation of a plan for implementation and monitoring of the proposed solution
4. Graduates will be able to analyze the ethical dimensions of a real estate situation and relate those dimensions to professional ethical standards.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for

continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

The real estate concentration satisfies the rigorous educational requirements of the Appraisal Institute's MAI designation. Students can satisfy most of the Appraisal Institute's education requirements by completing the concentration. This concentration provides comprehensive education in related disciplines so that graduates' analytical skills and abilities to communicate with other professionals are greatly enhanced.

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete the following undergraduate prerequisite courses:

Curriculum requirements

Prerequisite undergraduate courses

Course	Title	Hours
Calculus (or demonstrated quantitative ability)		3
FIRE 305	Principles of Real Estate	3
FIRE 425	Real Estate Appraisal	3
or FIRE 435	Real Estate Finance and Capital Markets	

Students must also complete up to four classes (zero to 12 credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waiver of a foundation course may be awarded when a student demonstrates equivalent knowledge, such as completing the required undergraduate equivalent course with a minimum grade of C.

Curriculum requirements

Course	Title	Hours
Foundation courses		
0-12 credits; courses may be waived for demonstrated equivalence.		
ACCT 507	Fundamentals of Accounting	
ECON 500	Concepts in Economics	
FIRE 520	Financial Concepts of Management	
SCMA 524	Statistical Fundamentals for Business Management	
Required core courses		
FIRE 627	Real Estate Development	3
FIRE 629	Real Estate Investment Analysis	3
FIRE 638	Real Property Investment Law	3
FIRE 658	Real Estate Finance and Investments	3
General finance requirement		
Select at least three credit hours from the following:		3
ECON 617	Financial Markets	
FIRE 621	Cases in Financial Management	
FIRE 623	Financial Management	
FIRE 650	Derivatives	
Approved electives		
Select 12 credit hours from the following and not used toward general finance requirement above:		12
FIRE 697	Guided Study in Finance, Insurance and Real Estate	
MGMT 654	Negotiations	
MKTG 673	Marketing Research	
MKTG 691	Topics in Marketing (marketing analytics)	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
URSP 621	Introduction to Geographic Information Systems	

Free elective	
Choose three credits approved by faculty adviser.	3
Total Hours	30

Total graduate credit hours required (minimum) 42 (30 if all foundation courses are waived)

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Program website: business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-real-estate (https://business.vcu.edu/graduate-studies/ms-in-business-with-a-concentration-in-real-estate)

Real Estate and Urban Land Development, Certificate in (Post-baccalaureate graduate certificate)

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The post-baccalaureate graduate Certificate in Real Estate and Urban Land Development is designed for professionals who seek an opportunity for advanced study in real estate and are more interested in the focused knowledge obtainable than receipt of a graduate degree. The certificate provides students the ability to advance their careers while receiving recognition for their academic accomplishment in the form of a graduate certificate. Many working professionals, especially those with undergraduate majors in the liberal arts, will find this program attractive since they can concentrate their energies on a tightly focused curriculum without enrolling in a large number of prerequisite courses.

Student learning outcomes

1. Graduates will demonstrate the ability to communicate the qualitative and quantitative dimensions of real estate valuation in a clear and well-organized manner.
2. Graduates will be able to select, conceptualize and apply the appropriate quantitative measurement and analysis to correctly value real estate. Such methods might include an economic and financial analysis of commercial real estate investments, alternative financing structures and/or surveys of recent trends in the securitization of commercial real estate debt and equity markets.
3. Graduates will be able to analyze the ethical dimensions of a real estate situation and relate those dimensions to professional ethical standards. Specifically, graduates will have an understanding of the Uniform Standards of Professional Appraisal Practice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 1	
	Spring	Nov 1	
	Summer	Mar 1	

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), in order to be eligible to receive the certificate, a student must maintain an overall GPA of 3.0. Eighteen credit hours beyond the bachelor's degree are required for completion of this graduate certificate program. A maximum of one three-hour course taken at another AACSB-accredited institution may be transferred into this program. Students interested in later applying for admission into either the Master of Business Administration program with a concentration in real estate or the Master of Science in Business with a concentration in real estate valuation must do so through a separate application process. Admission is dependent on the applicant having achieved a 3.0 GPA in the graduate certificate and a satisfactory score on the GMAT examination.

Curriculum requirements

Course	Title	Hours
Courses		
FIRE 627	Real Estate Development	3
FIRE 629	Real Estate Investment Analysis	3
FIRE 638	Real Property Investment Law	3
FIRE 658	Real Estate Finance and Investments	3
Select two of the following:		6
ECON 617	Financial Markets	
FIRE 621	Cases in Financial Management	
FIRE 623	Financial Management	
FIRE 650	Derivatives	
MGMT 654	Negotiations	
MGMT 655	Entrepreneurship	
MKTG 674	Service Quality Management	
MKTG 678	Marketing Analytics	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
URSP 621	Introduction to Geographic Information Systems	
Total Hours		18

Total graduate credit hours required (minimum) 18

Graduate program director
Austen Gouldman
Director, graduate programs
Email: gouldmana@vcu.edu
Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/graduate-certificate-in-real-estate (http://business.vcu.edu/graduate-studies/graduate-certificate-in-real-estate)

Sport Leadership, Master of (M.S.L.)

The School of Business offers a structured graduate program combining classroom theory with exposure to relevant field experiences. Through the sport leadership program, students will be prepared to assume the responsibilities for developing professional and amateur athletes and managing sports programs in a variety of academic, public and private sectors. The interdisciplinary faculty and curriculum give students the opportunity to concentrate on areas most important to them and most relevant to the sports business. Students of the program are required to complete a comprehensive examination.

The program offers graduate courses online for those students who want to take advantage of educational opportunities via the Internet. Currently, three online classes are available each semester.

Student learning outcomes

1. Content knowledge of sport industry: Students will be able to analyze and synthesize information and develop plans to address issues in sport leadership.
2. Development of interpersonal skills and professionalism: Students will demonstrate interpersonal skills and professionalism appropriate to the fields of sport management and coaching.
3. Development of leadership skills: Students will demonstrate content knowledge of leadership skills and traits, as well as the ability to utilize these skills and traits in a professional setting.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's

faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.L.	Fall	Apr 15	GRE or MAT
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Students should contact the Center for Sport Leadership at VCU at (804) 828-7821 or link directly to sportleadership.vcu.edu (http://www.sportleadership.vcu.edu) for information and application materials.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 36 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Examination requirement: Students must pass a comprehensive examination (see below).
4. Externship requirement: Students must complete an externship in the sport field.

Comprehensive examination

1. Written comprehensive examinations are required for all graduate students in the VCU Center for Sport Leadership.
2. Comprehensive examinations will take place at the end of the spring semester for each cohort of full-time, on-campus students and at the completion of 30 credit hours of course work for all part-time/distance-learning students.
3. Comprehensive examinations will be evaluated in a pass/fail format.
4. Comprehensive examinations will be independently evaluated by two faculty members; in the case that the faculty members disagree, a third faculty member will be brought in for a final decision.
5. Any student failing the comprehensive examination will have one additional opportunity to pass the exam. Failure to pass the comprehensive examination the second time will result in the student being dropped from the degree program.

Curriculum requirements

Course	Title	Hours
Required core		
SPTL 603	Research Methods in Sport	3
SPTL 630	Sociology of Sport	3
SPTL 632	Sport Business	3
SPTL 633	Marketing of Sport	3
SPTL 635	Leadership Models in Sport	3
SPTL 643	Sport Law	3
Elective courses		18
SPTL/HEMS 591	Topical Seminar (maximum six)	
SPTL 604	Research Practicum [1]	
SPTL 607	Field Instruction [1]	
SPTL 608	Sport and Entertainment Event Development	
SPTL 610	Sport and Entertainment Event Development	
SPTL 631	Contemporary Issues in Sport	
SPTL 634	Foundations of Coaching	
SPTL 640	Sport Media and Communications	
SPTL 641	Sports Psychology	
SPTL 642	Sport Ethics	
SPTL 644	NCAA Collegiate Coaching	
SPTL 651	Advanced Coaching Techniques	
SPTL 691	Topics in Sport Leadership	
SPTL 692	Independent Study [1]	
SPTL 695	Externship [1]	
Any 600-level SPTL course not otherwise required for the major		
Total Hours		36

[1]These courses are field experiences and may be taken for up to nine of the 18 elective credits.

Total graduate credit hours required (minimum) 36

Graduate program director
Carrie W. LeCrom, Ph.D.
Executive director, Center for Sport Leadership
Email: celecrom@vcu.edu

Phone: (804) 828-6443

M.B.A. programs

The School of Business allows students to complete requirements for an M.B.A. using two distinct modalities.

The curriculum for the evening M.B.A. program is flexible and is designed for students with diverse undergraduate backgrounds. Students may elect an M.B.A. without a concentration or may choose an M.B.A. with a single or double concentration. Concentrations are available in business analytics, corporate finance, entrepreneurship and innovation, global business, health care management, information resources management, investments, real estate, and supply chain management. Most classes are held in the evening to accommodate working students' schedules. Classes typically meet one evening a week from 7 to 9:40 p.m. or in the early evening from 5:30 to 6:45 p.m. For additional information about the program, visit vcu.edu/mba (http://www.vcu.edu/mba).

The Executive M.B.A. curriculum takes advantage of students' midlevel and executive professional experience by using it as a foundation on which to build a more sophisticated understanding of business. Core program components and differentiators include its integrated structure, experiential exercises and real-world application, which enable students to transition easily between the business world and their studies.

The program's innovative, integrated modular structure enables students to approach issues by module topic, which accurately reflects the multidisciplinary demands of the real business world. The program is targeted to rising business executives, entrepreneurs, nonprofit managers and service professionals. It differs from other master's programs at VCU because of its unique modular curriculum, which integrates components of communication, technology, service/quality, globalization and strategy.

The Executive M.B.A. program is a lockstep program that meets alternating weekends, Fridays from 12:30 to 6:15 p.m. and Saturdays from 8 a.m. to 2:15 p.m. The program can be completed in approximately 20 months.

Traditional program options

- Business Administration, Master of (M.B.A.) (p. 399)
- Business Administration, Master of (M.B.A.) with a concentration in business analytics (p. 402)
- Business Administration, Master of (M.B.A.) with a concentration in corporate finance (p. 404)
- Business Administration, Master of (M.B.A.) with a concentration in entrepreneurship and innovation (p. 406)
- Business Administration, Master of (M.B.A.) with a concentration in global business (p. 408)
- Business Administration, Master of (M.B.A.) with a concentration in health care management (p. 410)
- Business Administration, Master of (M.B.A.) with a concentration in information resources management (p. 411)
- Business Administration, Master of (M.B.A.) with a concentration in investments (p. 413)
- Business Administration, Master of (M.B.A.) with a concentration in real estate (p. 415)
- Business Administration, Master of (M.B.A.) with a concentration in supply chain management (p. 417)

Executive program options

- Business Administration, Master of (M.B.A.) [Executive] (p. 426)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in business analytics (p. 427)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in corporate finance (p. 429)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in entrepreneurship and innovation (p. 430)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in global business (p. 432)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in health care management (p. 433)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in information resources management (p. 434)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in investments (p. 436)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in real estate (p. 437)
- Business Administration, Master of (M.B.A.) [Executive] with a concentration in supply chain management (p. 438)

Combined/dual degree programs

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science (M.S.) [combined] (p. 418)

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science in (M.S.) with a concentration in information technology management [Executive] [combined] (p. 421)

Business Administration, Master of (M.B.A.)/Sport Leadership, Master of Education (M.Ed.) [dual degree] (p. 423)

Pharmacy, Doctor of (Pharm.D.)/Business Administration, Master of (M.B.A.) [combined] (p. 425)

Business Administration, Master of (M.B.A.) [Executive]/Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive] [combined] (p. 440)

Business Administration, Master of (M.B.A.)

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

An M.B.A. from VCU benefits students at various points in their careers. Individuals who have recently received their baccalaureate degrees may choose to refine their business skills while their undergraduate training is fresh. Individuals with work experience often find that an M.B.A. is the

key to rapid promotion or a career change. Finally, an M.B.A. from VCU meets the needs of students who recognize that the best preparation for an uncertain future is continuous learning.

Student learning outcomes

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students in the M.B.A. program must complete a minimum of 45 graduate credit hours. In addition, a prerequisite course in precalculus is required. This prerequisite may be waived for students who present satisfactory equivalent preparation. Applicants who have not met this prerequisite may take the course after admission.

Students are expected to enter the program with basic computing proficiency. Specific expectations will be provided by the Graduate Studies in Business Office. Specific means of evaluating and correcting any deficiency also will be identified.

Curriculum requirements

The curriculum for the M.B.A. program is flexible and is designed for students with diverse undergraduate backgrounds. Students may elect

an M.B.A. without a concentration or may choose an M.B.A. with a single or double concentration.

Most classes are held in the evening to accommodate working students' schedules. Classes typically meet one evening a week from 7 to 9:40 p.m. or twice a week in the early evening from 5:30 to 6:45 p.m. For additional information about the program, visit vcu.edu/mba (http://www.vcu.edu/mba).

Course	Title	Hours
Required courses		
ACCT 507	Fundamentals of Accounting	3
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 520	Financial Concepts of Management	3
FIRE 623	Financial Management	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 641	Leading People and Organizations	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
ECON 607	Advanced Macroeconomic Theory	
ECON 609	Advanced International Economics	
ECON 612	Econometrics	
ECON 616	Advanced Public Finance	
ECON 617	Financial Markets	
ECON 620	The Economics of Industry	
ECON 631	Labor Market Theory and Analysis	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
ECON 697	Guided Study in Economics	
ENGR 691	Special Topics in Engineering	
ENVS 691	Topics in Environmental Studies	
FIRE 621	Cases in Financial Management	
FIRE 622	Financial Management of Financial Institutions	
FIRE 625	Group Insurance and Pension Planning	
FIRE 626	Risk Management	
FIRE 627	Real Estate Development	
FIRE 629	Real Estate Investment Analysis	
FIRE 635	Investments and Security Analysis	
FIRE 638	Real Property Investment Law	
FIRE 639	International Finance	
FIRE 650	Derivatives	
FIRE 654	Short-term Financial Management	
FIRE 657	Current Issues in Investments and Markets	
FIRE 658	Real Estate Finance and Investments	
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 691	Topics in Information Systems	
INFO 697	Guided Study in Information Systems	
MGMT 637	Advanced Human Resource Management	
MGMT 644	International Business Management	
MGMT 649	Compensation Policy and Administration	
MGMT 655	Entrepreneurship	
MGMT 656	Best Practices in Leadership	
MGMT 680	Health, Safety and Security Administration	
MGMT 682	Human Resource Staffing	
MGMT 684	Issues in International Human Resource Management	
MGMT 691	Topics in Management	
MGMT 697	Guided Study in Management	
MKTG 656	International Marketing	
MKTG 657	International Market Planning Project	
MKTG 672	Concepts in Consumer Behavior	
MKTG 673	Marketing Research	
MKTG 674	Service Quality Management	
MKTG 691	Topics in Marketing	
MKTG 693	Field Project in Marketing	
MKTG 697	Guided Study in Marketing	
OPER 528	Stochastic Simulation	
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods (must have completed SCMA 632)	
SCMA 645	Management Science	
SCMA 646	Legal Foundations of Employment	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
SCMA 677	Quality Management and Six Sigma	
Total Hours		45

Total graduate credit hours required (minimum) 45

Students have the opportunity to combine the M.B.A. with a specialized master's degree program and have 12 credit hours count toward both degree programs. Specific opportunities and shared courses are outlined below.

For students pursuing the M.B.A. combined with the Master of Accountancy

Course	Title	Hours
ACCT 604	Advanced Auditing [1]	3
ACCT 610	Forensic Accounting [1]	3
ACCT 662	Advanced Topics in Accounting Information Systems [1]	3
INFO 661	Information Systems for Managers (fulfills elective requirement in the M.Acc.)	3

For students pursuing the M.B.A. combined with the Master of Arts in Economics

Course	Title	Hours
ECON 604	Advanced Microeconomic Theory [1]	3
ECON 607	Advanced Macroeconomic Theory [1]	3
ECON 612	Econometrics [1]	3
FIRE 623	Financial Management (fulfills elective requirement in the M.A.)	3

For students pursuing the M.B.A. combined with the Master of Decision Analytics

Course	Title	Hours
INFO 610	Analysis and Design of Database Systems [1]	3
SCMA 632	Statistical Analysis and Modeling [1]	3
SCMA 645	Management Science [1]	3
SCMA 675	Operations Management (fulfills elective requirement in the M.D.A.)	3

For students pursuing the M.B.A. combined with the Master of Product Innovation

Course	Title	Hours
INNO 501	Arts Principles for Product Innovation [1]	3
INNO 590	da Vinci Project [1]	3
INNO 600	Integrative Design Studio [1]	3
INFO 661	Information Systems for Managers (fulfills requirement for INNO 503 in the M.P.I.)	3

For students pursuing the M.B.A. combined with the Master of Science in Business with a concentration in finance

Course	Title	Hours
FIRE 621	Cases in Financial Management [1]	3
FIRE 622	Financial Management of Financial Institutions [1]	3
FIRE 623	Financial Management	3
FIRE 625	Group Insurance and Pension Planning [1]	3

For students pursuing the M.B.A. combined with the Master of Science in Business with a concentration in global marketing management

Course	Title	Hours
MGMT 642	Business Policy and Strategy	3
MKTG 656	International Marketing [1]	3
MKTG 657	International Market Planning Project [1]	3
MKTG 671	Marketing Management [1]	3

For students pursuing the M.B.A. combined with the Master of Science in Business with a concentration in real estate

Course	Title	Hours
FIRE 623	Financial Management (fulfills elective requirement in the M.S.)	3
FIRE 627	Real Estate Development [1]	3
FIRE 629	Real Estate Investment Analysis [1]	3
FIRE 638	Real Property Investment Law [1]	3

For students pursuing the M.B.A. combined with the Master of Supply Chain Management

Course	Title	Hours
SCMA 602	Global Supply Chain Management [1]	3
SCMA 603	SAP ERP and Supply Chain Management [1]	3
SCMA 606	Supply Chain Innovation [1]	3
SCMA 675	Operations Management	3

[1]

For students pursuing the combined programs mentioned above, these courses fulfill the nine credits of electives for the M.B.A. program.

Electives and concentrations

Project courses (693), topics courses (691) and guided studies (697) may be available for use toward concentration electives. These courses must be preapproved by the director of graduate studies.

Courses at the 500- or 600-level taken outside of the School of Business may be used with the permission of the director of graduate studies in business. Students must satisfy the necessary prerequisites for all electives.

Graduate program director

Austen Gouldman
Director, graduate programs
Email: gouldmana@vcu.edu
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Additional contact

Robert Clarkson
Program manager
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Phone: (804) 828-1597

Additional contact

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in business analytics

Program accreditation

Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

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Student learning outcomes

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
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7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
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In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students in the M.B.A. program must complete a minimum of 45 graduate credit hours. In addition, a prerequisite course in precalculus is required. This prerequisite may be waived for students who present

satisfactory equivalent preparation. Applicants who have not met this prerequisite may take the course after admission.

Students are expected to enter the program with basic computing proficiency. Specific expectations will be provided by the Graduate Studies in Business Office. Specific means of evaluating and correcting any deficiency also will be identified.

Curriculum requirements

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Most classes are held in the evening to accommodate working students' schedules. Classes typically meet one evening a week from 7 to 9:40 p.m. or twice a week in the early evening from 5:30 to 6:45 p.m. For additional information about the program, visit vcu.edu/mba (http://www.vcu.edu/mba).

Course	Title	Hours
Required courses		
ACCT 507	Fundamentals of Accounting	3
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 520	Financial Concepts of Management	3
FIRE 623	Financial Management	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 641	Leading People and Organizations	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
ECON 612	Econometrics	
ECON 617	Financial Markets	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
INFO 614	Data Mining	
MKTG 673	Marketing Research	
OPER 528	Stochastic Simulation	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods (must have completed SCMA 632)	
SCMA 645	Management Science	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
SCMA 677	Quality Management and Six Sigma	
Total Hours		45

Total graduate credit hours required (minimum) 45

Electives and concentrations
Project courses (693), topics courses (691) and guided studies (697) may be available for use toward concentration electives. These courses must be preapproved by the director of graduate studies.

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Additional contact
Graduate Studies in Business
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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in corporate finance

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

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Student learning outcomes

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7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
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MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
ECON 617	Financial Markets	
FIRE 621	Cases in Financial Management	
FIRE 622	Financial Management of Financial Institutions	
FIRE 626	Risk Management	
FIRE 639	International Finance	
FIRE 654	Short-term Financial Management	
Total Hours		45

Total graduate credit hours required (minimum) 45

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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in entrepreneurship and innovation

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
ENGR 691	Special Topics in Engineering (when the topic is chemical process design and development)	

MGMT 655	Entrepreneurship	
MKTG 657	International Market Planning Project	
MKTG 693	Field Project in Marketing	
Total Hours		45

Total graduate credit hours required (minimum) 45

Electives and concentrations
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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in global business

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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SCMA 524	Statistical Fundamentals for Business Management	3
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Electives		
Select three of the following:		9
ECON 609	Advanced International Economics	
FIRE 639	International Finance	
MGMT 644	International Business Management	
MKTG 656	International Marketing	
MKTG 657	International Market Planning Project	
Total Hours		45

Total graduate credit hours required (minimum) 45

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Business Administration, Master of (M.B.A.) with a concentration in health care management

Program accreditation
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Course	Title	Hours
Required courses		
ACCT 507	Fundamentals of Accounting	3
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 520	Financial Concepts of Management	3
FIRE 623	Financial Management	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 641	Leading People and Organizations	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Required concentration courses		
FMBA 614	Health Care Management I: National Perspective	3
FMBA 615	Health Care Management II: Employer's Perspective	3
FMBA 616	Health Care Management III: Industry Perspective	3
Total Hours		45

Total graduate credit hours required (minimum) 45

Graduate program director
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Additional contact
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Graduate Studies in Business
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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in information resources management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

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Student learning outcomes

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
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4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
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MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 643	Information Technology Project Management (with permission)	
INFO/CISS 644	Principles of Computer and Information Systems Security	
Total Hours		45

Total graduate credit hours required (minimum) 45

Electives and concentrations
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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in investments

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
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Degree requirements

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Required courses		
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MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
ECON 617	Financial Markets	
FIRE 622	Financial Management of Financial Institutions	

FIRE 635	Investments and Security Analysis	
FIRE 650	Derivatives	
Total Hours		45

Total graduate credit hours required (minimum) 45

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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in real estate

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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M.B.A.	Fall	Jul 1	GMAT or GRE
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In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

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MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Electives		
Select three of the following:		9
FIRE 627	Real Estate Development	
FIRE 629	Real Estate Investment Analysis	
FIRE 638	Real Property Investment Law	
FIRE 658	Real Estate Finance and Investments	
Total Hours		45

Total graduate credit hours required (minimum) 45

Electives and concentrations

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Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.) with a concentration in supply chain management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 675	Operations Management	3
Required concentration courses		
SCMA 677	Quality Management and Six Sigma	3
MGMT 691	Topics in Management (when the topic is supply chain management)	3
Elective		
MKTG 691	Topics in Marketing (when the topic is marketing analytics)	3
or SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		45

Total graduate credit hours required (minimum) 45

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Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/mba.html (http://business.vcu.edu/graduate/mba.html)

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science (M.S.) [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Master of Business Administration

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

An M.B.A. from VCU benefits students at various points in their careers. Individuals who have recently received their baccalaureate degrees may choose to refine their business skills while their undergraduate training is fresh. Individuals with work experience often find that an M.B.A. is the key to rapid promotion or a career change. Finally, an M.B.A. from VCU

meets the needs of students who recognize that the best preparation for an uncertain future is continuous learning.

Master of Science in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles using information systems to support organizations. The program is intended to provide a graduate-level, business-technology-oriented curriculum that focuses on the design and development of information systems to solve real-world problems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing systems using state-of-the-art technologies within organizations.

Student learning outcomes

For M.B.A. graduates

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

For M.S. in Information Sciences graduates

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S. and M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the combined Master of Business Administration and Master of Science in Information Systems program must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students can earn both M.B.A. and M.S. in Information Systems degrees by having 12 credit hours counted toward both degrees.

Students in the combined degree program will follow the same schedule as regular M.B.A. students, including the two lockstep semesters. To get both degrees, students will take all foundation courses required for the M.B.A. (unless waived), all nine core courses required for the M.B.A. and nine additional courses in the M.S. in Information Systems program, including INFO 610, INFO 620 and INFO 630. Students whose undergraduate degrees are not in information systems may also be required to take additional undergraduate prerequisite courses before taking the graduate information systems courses, as determined by the program adviser. The INFO 661 course taken for the M.B.A. will substitute for INFO 640, normally required for the M.S. in Information Systems degree, and three of the additional information systems courses also will count toward the normally required three elective courses in the M.B.A. program.

One of the information systems courses must have substantial global, entrepreneurial and/or experiential components. The six information systems courses to be taken in addition to INFO 661, INFO 664, INFO 610, INFO 620 and INFO 630 must be approved by the program adviser, and would normally be selected to satisfy one of the M.S. in Information Systems concentrations.

Curriculum requirements

Course	Title	Hours
Foundation courses (not included in 54 hours required for combined degree program)		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
MGMT 540	Management Theory and Practice	3
MKTG 570	Concepts and Issues in Marketing	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 530	Fundamentals of the Legal Environment of Business	3
Total Hours		21

M.B.A. course work

Course	Title	Hours
Advanced courses		
Each student must begin the advanced portion of the program with the courses below in each of the first two semesters. Full-time students will take additional courses from the remainder of the advanced program.		
Semester one (to be taken at the same time)		
ECON 610	Managerial Economics	3
MGMT 641	Leading People and Organizations	3
Semester two		
FIRE 623	Financial Management	3
Remainder of the advanced program		
ACCT 608	Managerial Accounting Concepts	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 675	Operations Management	3
Total Hours		27

M.S. in Information Systems course work

Course	Title	Hours
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
Electives		
Select six of the following:		18
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO/CISS 616	Data Warehousing	
INFO 622	Internet Security Management	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 646	Security Policy Formulation and Implementation	
INFO 654	Systems Interface Design	
INFO 658	Securing the Internet of Things	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
Total Hours		27

Total graduate credit hours required (minimum) 54

Students in the combined program who wish to have an M.B.A. concentration other than information resources management would need to complete an additional three courses for the concentration area.

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Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/combined-mbams-in-information-systems (http://business.vcu.edu/graduate-studies/combined-mbams-in-information-systems)

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science in (M.S.) with a concentration in information technology management [Executive] [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Master of Business Administration

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

An M.B.A. from VCU benefits students at various points in their careers. Individuals who have recently received their baccalaureate degrees may choose to refine their business skills while their undergraduate training is fresh. Individuals with work experience often find that an M.B.A. is the key to rapid promotion or a career change. Finally, an M.B.A. from VCU meets the needs of students who recognize that the best preparation for an uncertain future is continuous learning.

Master of Science in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Students may choose a curriculum with no concentration or a concentration in information risk, security and assurance. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS systems using state-of-the-art technologies within organizations.

Student learning outcomes

For M.B.A. graduates

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

For M.S. in Information Sciences graduates

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
M.S.	Spring only	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the combined Master of Business Administration and Executive Master of Science in Information Systems with a concentration in information technology management program must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students can earn both M.B.A. and M.S. in Information Systems degrees by having 12 credit hours counted toward both degrees, thus requiring only 54 credit hours total of advanced course work (not counting foundation courses), rather than the 36 and 30 credit hours normally required for the two degrees.

To obtain both degrees, students will complete the entire 30 credit-hour information system master's program plus six M.B.A. core courses (ECON 610, FIRE 623, ACCT 608, MGMT 642, SCMA 675 and MKTG 671) plus two elective courses. Students must also complete any designated required courses. The course ISTM 671 will substitute for MGMT 641; ISTM 672 will substitute for INFO 661; and ISTM 677 will substitute for INFO 664. ISTM 673 will count toward one of the three required M.B.A. elective courses.

Curriculum requirements

Course	Title	Hours
Foundation courses (Not included in 54 hours required for combined degree program.)		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
MGMT 540	Management Theory and Practice	3
MKTG 570	Concepts and Issues in Marketing	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 530	Fundamentals of the Legal Environment of Business	3
Total Hours		21

M.B.A. course work

Course	Title	Hours
Advanced core courses		
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 623	Financial Management	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 675	Operations Management	3
Electives (two)		6
Total Hours		24

M.S. in Information Systems course work

Course	Title	Hours
ISTM 671	Organizational Culture and Team Building	3
ISTM 672	Information Systems Management	3
ISTM 673	Analysis and Decisions	3
ISTM 674	Emerging Technologies	3
ISTM 675	IS Planning and Project Management	3

ISTM 676	Information Systems Assurance and Security Management	3
ISTM 677	Structuring Information for Decision Making	3
ISTM 678	IS in the Digital Economy	3
ISTM 679	Enterprise Information Systems	3
ISTM 691	Topics in IT Management	3
Total Hours		30

Total graduate credit hours required (minimum) 54

Students in the combined program who wish to have an M.B.A. concentration other than information resources management would need to complete an additional three courses for the concentration area.

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Program website: business.vcu.edu/graduate-studies/combined-mbams-in-information-systems (http://business.vcu.edu/graduate-studies/combined-mbams-in-information-systems)

Business Administration, Master of (M.B.A.)/Sport Leadership, Master of Education (M.Ed.) [dual degree]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The dual-degree M.B.A./M.Ed. in Sport Leadership program will prepare students for leadership positions by combining the business teaching of an M.B.A. program with sport industry-specific knowledge gained in the M.Ed. program. This degree combination recognizes the growing complexity of the sport industry and reinforces the Center for Sport Leadership's commitment to preparing students for the leadership challenges of the future. The dual degree offers students course work and knowledge they will need to be successful in a business setting combined with the application and networking skills required in today's sport industry.

The M.B.A. phase of the program will encompass a problem-based learning style, immersing students in collaborative projects and working situations that are commonplace in the business world. Students will learn business concepts in a real-life context and develop skills in communication, collaboration and teamwork that are essential for success, while developing their abilities to be creative, take initiative and accept personal responsibility for their actions.

The M.Ed. program will combine classroom and practical experience to prepare individuals for leadership positions in the sport industry. An interdisciplinary approach gives students the freedom to choose courses of personal interest and build a foundation of knowledge in their desired career fields.

Student learning outcomes

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to appropriately apply techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
7. Graduates should be able to evaluate marketing programs.
8. Students should be able to think critically and systematically about financial issues in businesses and to develop techniques to analyze these issues numerically.
9. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A. and M.Ed.	Fall		GMAT or GRE

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students can complete both degrees with two years of study and will receive both degrees at the conclusion of the entire program. Students may enter the program only in the fall semester.

Curriculum requirements

Course	Title	Hours
Courses		
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 623	Financial Management	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 641	Leading People and Organizations	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 675	Operations Management	3
SPTL 603	Research Methods in Sport	3
SPTL 608	Sport and Entertainment Event Development	3
SPTL 610	Sport and Entertainment Event Development	3
SPTL 630	Sociology of Sport	3
SPTL 632	Sport Business	3
SPTL 643	Sport Law	3
SPTL 695	Externship	1-6
Electives		
Select four of the following:		9
CISS 697	Guided Study	
ECON 604	Advanced Microeconomic Theory	
ECON 607	Advanced Macroeconomic Theory	
ECON 609	Advanced International Economics	
ECON 612	Econometrics	
ECON 616	Advanced Public Finance	
ECON 617	Financial Markets	
ECON 620	The Economics of Industry	
ECON 631	Labor Market Theory and Analysis	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
ECON 697	Guided Study in Economics	
ENGR 691	Special Topics in Engineering	
ENVS 691	Topics in Environmental Studies	
FIRE 621	Cases in Financial Management	
FIRE 622	Financial Management of Financial Institutions	
FIRE 625	Group Insurance and Pension Planning	
FIRE 626	Risk Management	
FIRE 627	Real Estate Development	
FIRE 629	Real Estate Investment Analysis	
FIRE 635	Investments and Security Analysis	
FIRE 638	Real Property Investment Law	
FIRE 639	International Finance	
FIRE 650	Derivatives	
FIRE 654	Short-term Financial Management	
FIRE 657	Current Issues in Investments and Markets	
FIRE 658	Real Estate Finance and Investments	
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 691	Topics in Information Systems	
INFO 697	Guided Study in Information Systems	
MGMT 637	Advanced Human Resource Management	
MGMT 644	International Business Management	
MGMT 649	Compensation Policy and Administration	

MGMT 655	Entrepreneurship	
MGMT 656	Best Practices in Leadership	
MGMT 680	Health, Safety and Security Administration	
MGMT 682	Human Resource Staffing	
MGMT 684	Issues in International Human Resource Management	
MGMT 691	Topics in Management	
MGMT 697	Guided Study in Management	
MKTG 656	International Marketing	
MKTG 657	International Market Planning Project	
MKTG 672	Concepts in Consumer Behavior	
MKTG 673	Marketing Research	
MKTG 674	Service Quality Management	
MKTG 691	Topics in Marketing	
MKTG 693	Field Project in Marketing	
MKTG 697	Guided Study in Marketing	
OPER 528	Stochastic Simulation	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods (must have completed SCMA 632)	
SCMA 645	Management Science	
SCMA 646	Legal Foundations of Employment	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
SCMA 677	Quality Management and Six Sigma	
SPTL 634	Foundations of Coaching	
SPTL 640	Sport Media and Communications	
SPTL 644	NCAA Collegiate Coaching	
SPTL 645	Sales and Development	
SPTL 691	Topics in Sport Leadership	
Total Hours		60

Note: MGMT 641, MKTG 671, SPTL 695 and one elective (three credit hours) from either program may be counted toward both the M.B.A. and the M.Ed. degrees.

Sample plan of study

Year one		
Fall semester		**Hours**
ECON 610	Managerial Economics	3
MGMT 641	Leading People and Organizations	3
SPTL 603	Research Methods in Sport	3
SPTL 643	Sport Law	3
	Term Hours:	12
Spring semester		
FIRE 623	Financial Management	3
MKTG 671	Marketing Management	3
SPTL 630	Sociology of Sport	3
SPTL 632	Sport Business	3
	Term Hours:	12
Summer semester		
SPTL 695	Externship	1-6
One business elective		1-3
	Term Hours:	2-9
Year two		
Fall semester		
ACCT 608	Managerial Accounting Concepts	3
INFO 661	Information Systems for Managers	3
SPTL 608	Sport and Entertainment Event Development	3
One business or SPTL elective from above or other courses with approval		3
	Term Hours:	12
Spring semester		
ACCT 608	Managerial Accounting Concepts	3
INFO 661	Information Systems for Managers	3
SPTL 608	Sport and Entertainment Event Development	3
One SPTL elective from above or other courses with approval		3
	Term Hours:	12
Summer semester		
MGMT 642	Business Policy and Strategy	3
One SPTL elective from above or other courses by approval		3
	Term Hours:	6
	Total Hours:	56-63

Concentrations

M.B.A./M.Ed. students who wish to have a concentration would need to complete an additional three courses.

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Program website: business.vcu.edu/graduate-studies/combined-med-in-sport-leadershipmba (http://business.vcu.edu/graduate-studies/combined-med-in-sport-leadershipmba)

Pharmacy, Doctor of (Pharm.D.)/Business Administration, Master of (M.B.A.) [combined]

The Pharm.D./M.B.A. program seeks to prepare pharmacists for careers that encompass pharmacy and business theories and principles. The program is designed to take advantage of efficiencies and electives in both the Pharm.D. and M.B.A. programs. Students in the combined program can earn both degrees and save as much as one year or more over the time required for completing the programs separately.

Students may be admitted into the program after the first year of enrollment in the Pharm.D. program. Applicants must be enrolled in the Pharm.D. program, have demonstrated a good academic record and have successfully completed the Graduate Management Admission Test.

To obtain both degrees, students will take all pharmacy courses unless waived, the seven business foundation courses, the nine M.B.A. core courses and three elective courses. The elective M.B.A. courses may be taken from pharmacy administration courses at the 600 level and a combination of a business seminar course and an elective advanced pharmacy practice experience in pharmacy management. The business foundation courses can be taken during the first two years in the pharmacy program with summer session(s). The M.B.A. core courses can be taken during the third and fourth years in the pharmacy program. The business electives can be taken during the fourth and fifth years in the combined program.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Application to Pharm.D./M.B.A. program

Students interested in pursuing the Pharm.D./M.B.A. program must first obtain admission to the Pharm.D. program. At the end of the first year of pharmacy school and after receiving permission from the combined degree committee in the School of Pharmacy, Pharm.D. students may apply to the M.B.A. program. Upon admission to the M.B.A. program, a Pharm.D. student will be considered a dual-degree-seeking student. Students generally will register for a mix of School of Business courses and School of Pharmacy courses in the fourth, fifth and sixth semesters of the pharmacy program.

A student categorized as a Pharm.D. student will be charged tuition and fees from the School of Pharmacy and will be eligible to receive financial aid awards as a Pharm.D. student. Students categorized as M.B.A. students will be charged tuition and fee rates as graduate students and be eligible to receive financial awards as graduate students.

Graduate program director
Austen Gouldman
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School of Pharmacy contact
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies, School of Pharmacy
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Program websites: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu) and business.vcu.edu/graduate (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
4. Demonstrate analytic skills using new and unfamiliar data sets

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 39 graduate credit hours. The program consists of 13 courses that are divided into seven integrated modules.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Total Hours		39

Total graduate credit hours required (minimum) 39

Graduate program director
M.K. "Butch" Sarma
Director, Executive M.B.A. program
Email: mksarma@vcu.edu
Phone: (804) 828-7036

Additional contacts
William J. Miller
Executive director, business development
Email: wjmille1@vcu.edu
Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in business analytics

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
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Degree candidacy requirements

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Graduation requirements

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

In addition to VCU Graduate School graduation requirements (p. 31), students seeking a concentration must complete a minimum of 48 graduate credit hours. The program consists of 13 courses that are divided into seven integrated modules plus the concentration electives.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
ECON 612	Econometrics	
ECON 617	Financial Markets	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
INFO 614	Data Mining	
MKTG 673	Marketing Research	
OPER 528	Stochastic Simulation	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods (must have completed SCMA 632)	
SCMA 645	Management Science	

SCMA 669	Developing and Implementing Forecasting Methods for Business
SCMA 677	Quality Management and Six Sigma
Total Hours	48

Total graduate credit hours required (minimum) 48

Graduate program director
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Additional contacts
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in corporate finance

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
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Graduation requirements

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Other information

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

In addition to VCU Graduate School graduation requirements (p. 31), students seeking a concentration must complete a minimum of 48 graduate credit hours. The program consists of 13 courses that are divided into seven integrated modules plus the concentration electives.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
ECON 617	Financial Markets	
FIRE 621	Cases in Financial Management	
FIRE 622	Financial Management of Financial Institutions	
FIRE 626	Risk Management	
FIRE 639	International Finance	
FIRE 654	Short-term Financial Management	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
Director, Executive M.B.A. program
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Additional contacts
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in entrepreneurship and innovation

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
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Degree candidacy requirements

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Graduation requirements

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Other information

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

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Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
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FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
ENGR 691	Special Topics in Engineering	
MGMT 655	Entrepreneurship	
MKTG 657	International Market Planning Project	
MKTG 693	Field Project in Marketing	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
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Phone: (804) 828-7036

Additional contacts
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Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in global business

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

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FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
ACCT 606		
ECON 609	Advanced International Economics	
FIRE 639	International Finance	
MGMT 644	International Business Management	
MKTG 656	International Marketing	
MKTG 657	International Market Planning Project	
Total Hours		48

Total graduate credit hours required (minimum) 48

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Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in health care management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

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Student learning outcomes

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A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

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Graduation requirements

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Other information

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

In addition to VCU Graduate School graduation requirements (p. 31), students seeking a concentration must complete a minimum of 48 graduate credit hours. The program consists of 13 courses that are divided into seven integrated modules plus the concentration electives.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
FMBA 614	Health Care Management I: National Perspective	3
FMBA 615	Health Care Management II: Employer's Perspective	3
FMBA 616	Health Care Management III: Industry Perspective	3
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
Director, Executive M.B.A. program
Email: mksarma@vcu.edu
Phone: (804) 828-7036

Additional contacts
William J. Miller
Executive director, business development
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in information resources management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

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FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 643	Information Technology Project Management (with permission)	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
Director, Executive M.B.A. program
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Additional contacts
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Executive director, business development
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in investments

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
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Other information

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

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In addition to VCU Graduate School graduation requirements (p. 31), students seeking a concentration must complete a minimum of 48 graduate credit hours. The program consists of 13 courses that are divided into seven integrated modules plus the concentration electives.

Curriculum requirements

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FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
ECON 617	Financial Markets	
FIRE 622	Financial Management of Financial Institutions	
FIRE 635	Investments and Security Analysis	
FIRE 650	Derivatives	
FIRE 657	Current Issues in Investments and Markets	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
Director, Executive M.B.A. program
Email: mksarma@vcu.edu
Phone: (804) 828-7036

Additional contacts
William J. Miller
Executive director, business development
Email: wjmille1@vcu.edu
Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in real estate

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall only	Feb 15 (for early decision)	
		Apr 22 (final decisions)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume

Degree requirements

The Executive M.B.A. program is designed for students with familiarity with significant work experience. The student's adviser will review the student's educational and professional background to determine the extent to which the student has satisfied the prerequisites. Those with outstanding prerequisites will be required to attend one or more training sessions to remove any deficiencies.

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FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Electives		
Select three of the following:		9
FIRE 627	Real Estate Development	
FIRE 629	Real Estate Investment Analysis	
FIRE 638	Real Property Investment Law	
FIRE 658	Real Estate Finance and Investments	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
M.K. "Butch" Sarma
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Additional contacts
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive] with a concentration in supply chain management

Program accreditation

Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

Student learning outcomes

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
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Admission requirements

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M.B.A.	Fall only	Feb 15 (for early decision)	
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Degree requirements

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FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Required concentration courses		
MGMT 691	Topics in Management (when the topic is supply chain management)	3
SCMA 677	Quality Management and Six Sigma	3
Elective		
MKTG 691	Topics in Marketing (when the topic is marketing analytics)	3
or SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
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Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Business Administration, Master of (M.B.A.) [Executive]/Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive] [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Executive M.B.A.

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

M.S. in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS using state-of-the-art technologies within organizations.

Student learning outcomes

Executive M.B.A.

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
4. Demonstrate analytic skills using new and unfamiliar data sets

M.S. in Information Systems

Graduates should be able to:

1. Communicate and network effectively within their professions and organizations; serve the profession by applying this knowledge broadly; and maintain key technical expertise in order to sustain required levels of competitiveness
2. Understand information technology as it applies to business contexts and effectively apply this technology in specific circumstances
3. Develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations
4. Develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments

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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A./M.S.	Fall	Feb 15 (for early decision)	
		Apr 22 (final decision)	
	Spring	Feb 1	

Admission notes regarding deadline: Students in the Executive M.B.A. program have the option to continue with the Executive M.S. in Information Systems with a concentration in information technology management program after having completed the requirements for the Executive M.B.A. to earn both degrees.

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 60 hours of graduate course work. Students pursuing this dual-degree option will have three courses in the Executive M.S. program waived. These three courses cover the information systems content of the Executive M.B.A. program.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Information systems courses		
ISTM 674	Emerging Technologies	3
ISTM 675	IS Planning and Project Management	3
ISTM 676	Information Systems Assurance and Security Management	3
ISTM 677	Structuring Information for Decision Making	3
ISTM 678	IS in the Digital Economy	3
ISTM 679	Enterprise Information Systems	3
ISTM 691	Topics in IT Management	3
Total Hours		60

Total graduate credit hours required (minimum) 60

Graduate program director
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Executive director, business development
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Phone: (804) 828-3491

Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Brandcenter

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (tracks): art direction, copywriting, creative brand management, experience design and strategy.

The Brandcenter program is focused on preparing students for successful careers. The working environment is similar to that of agencies and their clients. Teams of students work together to develop ideas and campaigns that solve business problems strategically and creatively. They also learn how to present those ideas in engaging and persuasive ways.

After their first year, qualified students are offered internships where they gain experience and foster industry relationships. In their second year, students have the opportunity to network with professional mentors, guest speakers, alumni and recruiters from agencies and organizations around the country. Once students graduate, they become part of a tight-knit alumni network.

Mission

The VCU Brandcenter's mission is to develop the best creative problem-solvers in the world.

- Business, Master of Science (M.S.) with a concentration in branding/art direction (p. 442)
- Business, Master of Science (M.S.) with a concentration in branding/copywriting (p. 443)
- Business, Master of Science (M.S.) with a concentration in branding/creative brand management (p. 445)
- Business, Master of Science (M.S.) with a concentration in branding/experience design (p. 446)
- Business, Master of Science (M.S.) with a concentration in branding/strategy (p. 447)

Business, Master of Science (M.S.) with a concentration in branding/art direction

Program goals

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (subconcentrations): art direction, copywriting, creative brand management, experience design and strategy.

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Student learning outcomes

1. **Presentation skills:** Students will demonstrate the ability to effectively present/sell their ideas in a clear, concise and compelling manner.
2. **Collaboration:** Students will demonstrate their ability to work together in cross-functional teams/groups (i.e., as art directors, copywriters, creative brand managers, experience designers and strategists) to develop viable business/marketing solutions.
3. **Creative and critical problem-solving:** Students will demonstrate the ability to research consumer culture (via secondary research, syndicated research and qualitative/quantitative research methods) and evaluate consumer media/technology usage habits to develop media-neutral business solutions.
4. **Culture:** Students will demonstrate an appreciation, interest in and openness for different cultures (both national and international) yielding more relevant, culturally savvy business solutions.
5. **Craft:** Students will demonstrate the ability to execute specific skills related to their individual subconcentration.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu), and also complete the VCU Brandcenter application at brandcenter.vcu.edu/admissions (http://brandcenter.vcu.edu/admissions).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15 (final deadline for international students)	
		May 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the concentration must have a working knowledge of Photoshop and InDesign and knowledge of layout, design and typography. Applicants must have at least one year of working experience or have taken an undergraduate course or a tutorial in these skills.

Degree requirements

The M.S. in Business with a concentration in branding requires 42 graduate credit hours beyond the baccalaureate degree. Students devote two years of full-time study to complete the degree requirements. In addition to the VCU Graduate School graduation requirements (p. 31), all students in the Brandcenter must complete a core curriculum as well as courses required for a specific subconcentration and must present a final major project, in portfolio form, before a committee review panel.

Curriculum requirements

Course	Title	Hours
Core		
BRND 631	Craft	3
BRND 648	Innovation	3
BRND 651	Creative Thinking	3
BRND 659	Brand Experiences	3
BRND 664	Persuasion	3
BRND 677	The Business of Branding	3
BRND 696	Advanced Portfolio	3
Branding/art direction		
BRND 622	Visual Storytelling	3
BRND 630	Problem Solving for Art Directors	3
BRND 633	User Participation Platforms	3
BRND 652	Concept Development	3
BRND 653	Portfolio Development	3
BRND 670	Creative Fusion	3
BRND 673	Experimentation	3
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program director
Ashley Sommardahl
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Phone: (804) 828-8384

Additional contact
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Senior admissions counselor
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Phone: (804) 828-8384

Program website: brandcenter.vcu.edu (http://brandcenter.vcu.edu)

Business, Master of Science (M.S.) with a concentration in branding/copywriting

Program goals

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (subconcentrations): art direction, copywriting, creative brand management, experience design and strategy.

The Brandcenter program is focused on preparing students for successful careers. The working environment is similar to that of agencies and their clients. Teams of students work together to develop ideas and campaigns that solve business problems strategically and creatively. They also learn how to present those ideas in engaging and persuasive ways.

After their first year, qualified students are offered internships where they gain experience and foster industry relationships. In their second year, students have the opportunity to network with professional mentors, guest speakers, alumni and recruiters from agencies and organizations around the country. Once students graduate, they become part of a tight-knit alumni network.

Student learning outcomes

1. **Presentation skills:** Students will demonstrate the ability to effectively present/sell their ideas in a clear, concise and compelling manner.
2. **Collaboration:** Students will demonstrate their ability to work together in cross-functional teams/groups (i.e., as art directors, copywriters, creative brand managers, experience designers and strategists) to develop viable business/marketing solutions.

3. **Creative and critical problem-solving:** Students will demonstrate the ability to research consumer culture (via secondary research, syndicated research and qualitative/quantitative research methods) and evaluate consumer media/technology usage habits to develop media-neutral business solutions.
4. **Culture:** Students will demonstrate an appreciation, interest in and openness for different cultures (both national and international) yielding more relevant, culturally savvy business solutions.
5. **Craft:** Students will demonstrate the ability to execute specific skills related to their individual subconcentration.

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu), and also complete the VCU Brandcenter application at brandcenter.vcu.edu/admissions (http://brandcenter.vcu.edu/admissions).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15 (final deadline for international students)	
		May 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the concentration must have received a baccalaureate degree from an accredited college or university with demonstrated ability to perform at the graduate level.

Degree requirements

The M.S. in Business with a concentration in branding requires 42 graduate credit hours beyond the baccalaureate degree. Students devote two years of full-time study to complete the degree requirements. In addition to the VCU Graduate School graduation requirements (p. 31), all students in the Brandcenter must complete a core curriculum as well as courses required for a specific subconcentration and must present a final major project, in portfolio form, before a committee review panel.

Curriculum requirements

Course	Title	Hours
Core		
BRND 631	Craft	3
BRND 648	Innovation	3
BRND 651	Creative Thinking	3
BRND 659	Brand Experiences	3
BRND 664	Persuasion	3
BRND 677	The Business of Branding	3
BRND 696	Advanced Portfolio	3
Branding/copywriting		
BRND 622	Visual Storytelling	3
BRND 638	Brand Engagement	3
BRND 640	Problem Solving	3
BRND 652	Concept Development	3
BRND 653	Portfolio Development	3
BRND 670	Creative Fusion	3
BRND 673	Experimentation	3
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program director

Ashley Sommardahl
Director of student affairs and industry outreach
Email: asommardahl@vcu.edu
Phone: (804) 828-8384

Additional contact
Hawley Smyth
Senior admissions counselor
Email: smythh@vcu.edu (asommardahl@vcu.edu)
Phone: (804) 828-8384

Program website: brandcenter.vcu.edu (http://brandcenter.vcu.edu)

Business, Master of Science (M.S.) with a concentration in branding/creative brand management

Program goals

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (subconcentrations): art direction, copywriting, creative brand management, experience design and strategy.

The Brandcenter program is focused on preparing students for successful careers. The working environment is similar to that of agencies and their clients. Teams of students work together to develop ideas and campaigns that solve business problems strategically and creatively. They also learn how to present those ideas in engaging and persuasive ways.

After their first year, qualified students are offered internships where they gain experience and foster industry relationships. In their second year, students have the opportunity to network with professional mentors, guest speakers, alumni and recruiters from agencies and organizations around the country. Once students graduate, they become part of a tight-knit alumni network.

Student learning outcomes

1. **Presentation skills:** Students will demonstrate the ability to effectively present/sell their ideas in a clear, concise and compelling manner.
2. **Collaboration:** Students will demonstrate their ability to work together in cross-functional teams/groups (i.e., as art directors, copywriters, creative brand managers, experience designers and strategists) to develop viable business/marketing solutions.
3. **Creative and critical problem-solving:** Students will demonstrate the ability to research consumer culture (via secondary research, syndicated research and qualitative/quantitative research methods) and evaluate consumer media/technology usage habits to develop media-neutral business solutions.
4. **Culture:** Students will demonstrate an appreciation, interest in and openness for different cultures (both national and international) yielding more relevant, culturally savvy business solutions.
5. **Craft:** Students will demonstrate the ability to execute specific skills related to their individual subconcentration.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15 (final deadline for international students)	
		May 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the concentration must be proficient in Excel, PowerPoint/Keynote and Pages and must have successfully completed a college math class. The admissions committee is looking for a minimum GRE score of around 300 (current scoring) or 1100 (former scoring) or a minimum GMAT score of around 540.

Degree requirements

The M.S. in Business with a concentration in branding requires 42 graduate credit hours beyond the baccalaureate degree. Students devote two years of full-time study to complete the degree requirements. In addition to the VCU Graduate School graduation requirements (p. 31), all students in the Brandcenter must complete a core curriculum as well as courses required for a specific subconcentration and must present a final major project, in portfolio form, before a committee review panel.

Curriculum requirements

Course	Title	Hours
Core		
BRND 631	Craft	3
BRND 648	Innovation	3
BRND 651	Creative Thinking	3
BRND 659	Brand Experiences	3
BRND 664	Persuasion	3
BRND 677	The Business of Branding	3
BRND 696	Advanced Portfolio	3
Branding/creative brand management		
BRND 608	Accounting for Communication Professionals	3
BRND 620	Brand Design for Brand Managers	3
BRND 629	Strategic Thinking	3
BRND 649	Brand Analytics	3
BRND 662	Research Methodologies	3
BRND 667	Applied Brand Management	3
BRND 668	Advanced Brand Management	3
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program director
Ashley Sommardahl
Director of student affairs and industry outreach
Email: asommardahl@vcu.edu
Phone: (804) 828-8384

Additional contact
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Phone: (804) 828-8384

Program website: brandcenter.vcu.edu (http://brandcenter.vcu.edu)

Business, Master of Science (M.S.) with a concentration in branding/experience design

Program goals

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (subconcentrations): art direction, copywriting, creative brand management, experience design and strategy.

The Brandcenter program is focused on preparing students for successful careers. The working environment is similar to that of agencies and their clients. Teams of students work together to develop ideas and campaigns that solve business problems strategically and creatively. They also learn how to present those ideas in engaging and persuasive ways.

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Student learning outcomes

1. **Presentation skills:** Students will demonstrate the ability to effectively present/sell their ideas in a clear, concise and compelling manner.
2. **Collaboration:** Students will demonstrate their ability to work together in cross-functional teams/groups (i.e., as art directors, copywriters, creative brand managers, experience designers and strategists) to develop viable business/marketing solutions.
3. **Creative and critical problem-solving:** Students will demonstrate the ability to research consumer culture (via secondary research, syndicated research and qualitative/quantitative research methods) and evaluate consumer media/technology usage habits to develop media-neutral business solutions.
4. **Culture:** Students will demonstrate an appreciation, interest in and openness for different cultures (both national and international) yielding more relevant, culturally savvy business solutions.
5. **Craft:** Students will demonstrate the ability to execute specific skills related to their individual subconcentration.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Other information

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15 (final deadline for international students)	
		May 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have a working knowledge of the Adobe Creative Suite and light HTML/CSS knowledge and have a specialty such as video production, animation, 3-D imaging, design, writing, etc.

Degree requirements

The M.S. in Business with a concentration in branding requires 42 graduate credit hours beyond the baccalaureate degree. Students devote two years of full-time study to complete the degree requirements. In addition to the VCU Graduate School graduation requirements (p. 31), all students in the Brandcenter must complete a core curriculum as well as courses required for a specific subconcentration and must present a final major project, in portfolio form, before a committee review panel.

Curriculum requirements

Course	Title	Hours
Core		
BRND 631	Craft	3
BRND 648	Innovation	3
BRND 651	Creative Thinking	3
BRND 659	Brand Experiences	3
BRND 664	Persuasion	3
BRND 677	The Business of Branding	3
BRND 696	Advanced Portfolio	3
Branding/experience design		
BRND 621	Strategy and Design	3
BRND 622	Visual Storytelling	3
BRND 623	Physical Computing I	3
BRND 624	Physical Computing II	3
BRND 633	User Participation Platforms	3
BRND 635	Creating Gravitational Pull	3
BRND 673	Experimentation	3
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program director
Ashley Sommardahl
Director of student affairs and industry outreach
Email: asommardahl@vcu.edu
Phone: (804) 828-8384

Additional contact
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Senior admissions counselor
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Program website: brandcenter.vcu.edu (http://brandcenter.vcu.edu)

Business, Master of Science (M.S.) with a concentration in branding/strategy

Program goals

The VCU Brandcenter offers graduate study in advertising, branding and experience design. The program offers a Master of Science in Business with a concentration in branding, and it is divided into five focus areas (subconcentrations): art direction, copywriting, creative brand management, experience design and strategy.

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Student learning outcomes

1. **Presentation skills:** Students will demonstrate the ability to effectively present/sell their ideas in a clear, concise and compelling manner.
2. **Collaboration:** Students will demonstrate their ability to work together in cross-functional teams/groups (i.e., as art directors, copywriters, creative brand managers, experience designers and strategists) to develop viable business/marketing solutions.
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4. **Culture:** Students will demonstrate an appreciation, interest in and openness for different cultures (both national and international) yielding more relevant, culturally savvy business solutions.
5. **Craft:** Students will demonstrate the ability to execute specific skills related to their individual subconcentration.

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Degree candidacy requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15 (final deadline for international students)	
		May 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the concentration must be proficient in Excel, PowerPoint/Keynote and Pages. The admissions committee is looking for a minimum GRE score of around 300 (current scoring) or 1100 (former scoring) or a minimum GMAT score of around 540.

Degree requirements

The M.S. in Business with a concentration in branding requires 42 graduate credit hours beyond the baccalaureate degree. Students devote two years of full-time study to complete the degree requirements. In addition to the VCU Graduate School graduation requirements (p. 31), all students in the Brandcenter must complete a core curriculum as well as courses required for a specific subconcentration and must present a final major project, in portfolio form, before a committee review panel.

Curriculum requirements

Course	Title	Hours
Core		
BRND 631	Craft	3
BRND 648	Innovation	3
BRND 651	Creative Thinking	3
BRND 659	Brand Experiences	3
BRND 664	Persuasion	3
BRND 677	The Business of Branding	3
BRND 696	Advanced Portfolio	3
Branding/strategy		
BRND 621	Strategy and Design	3
BRND 625	Comms Planning and UX	3
BRND 627	Visual Storytelling and Design for Strategists	3
BRND 629	Strategic Thinking	3
BRND 635	Creating Gravitational Pull	3
BRND 639	Cultural Impact: Advanced Account Planning	3
BRND 670	Creative Fusion	3
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program director
Ashley Sommardahl
Director of student affairs and industry outreach
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Additional contact
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Senior admissions counselor
Email: smythh@vcu.edu (asommardahl@vcu.edu)
Phone: (804) 828-8384

Program website: brandcenter.vcu.edu (http://brandcenter.vcu.edu)

Department of Accounting

Carolyn S. Norman, Ph.D.
Chair

business.vcu.edu/accounting.html (http://business.vcu.edu/accounting.html)

The future development of the accounting profession depends upon the quality of the educational foundation on which it rests. The Department of Accounting is committed to the support of professional accounting through the delivery of educational experiences directed toward practice and through research that addresses the important policy issues of the day.

The mission of the department is to prepare students for careers in accounting, to interpret and expand accounting knowledge, and to render service to the profession and communities. The department does so by:

1. Providing a learning environment in which students are encouraged to interact with others in identifying and solving accounting and business problems
2. Investigating, developing and sharing knowledge, which has the potential for significant influence on accounting, business and education
3. Interacting with the accounting profession, the business community and the community at large

Accountancy, Master of (M.Acc.) with a concentration in data analytics

Program accreditation

Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The purpose of the Master of Accountancy program is to provide the skills and knowledge necessary to be future leaders in the professional business community and the public sector for students who wish to specialize in the areas of accounting/information systems, auditing, financial reporting and accounting/other fields of business.

Student learning outcomes

- Students demonstrate current knowledge of financial accounting standards and other professional guidance that affects the profession, and they are able to apply that knowledge in a variety of professional contexts.
- Students demonstrate the ability to analyze accounting data, propose recommendations and design appropriate methods to communicate their recommendations.
- Students demonstrate the ability to distinguish ethical dilemmas and apply the appropriate ethical principles in a variety of accounting contexts and circumstances. Students evaluate information in a manner free of distortion, personal bias or conflicts of interest; recognize situations where professional ethical standards apply; respect confidentiality.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Acc.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the Master of Accountancy degree program who do not hold an undergraduate degree in accounting or business may be required to take up to 24 credit hours of business prerequisite courses and 27 credit hours of accounting prerequisite courses. These prerequisite courses may be waived for students who have successfully completed an equivalent course.

*

May be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25

Accounting prerequisites

Candidates must complete at least eight non-accounting business courses from the following list. (Equivalent 500-level courses may be substituted.) These courses may be waived if a student has completed the equivalent course in an undergraduate program.

Course	Title	Hours
ACCT 203 & ACCT 204	Introduction to Accounting I and Introduction to Accounting II	6
or ACCT 205	Introductory Accounting Survey	
ACCT 301	Tax Accounting Principles	3
ACCT 303	Intermediate Accounting I	3
ACCT 304	Intermediate Accounting II	3
ACCT 305	Intermediate Accounting III	3
ACCT 306	Cost Accounting	3
ACCT 307	Accounting Systems	3
ACCT 406	Auditing	3

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students in the Master of Accountancy program must complete a minimum of 30 credit hours of graduate course work with at least 15 credit hours in graduate accounting course work.

Curriculum requirements

Course	Title	Hours
Required courses		
ACCT 604	Advanced Auditing	3
ACCT 610	Forensic Accounting	3
ACCT 662	Advanced Topics in Accounting Information Systems	3
ACCT 680	Tax Research and Planning	3
SCMA 648	Analytics for Organizational Decision-making	3
Information systems and analytics concentration electives		
Select 12 credits from the following:		12
INFO 614	Data Mining	
INFO 640	Information Systems Management	
or INFO 661	Information Systems for Managers	
INFO 664	Information Systems for Business Intelligence	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 645	Management Science	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Business electives		
Select one course from the following:		3
FIRE 622	Financial Management of Financial Institutions	
FIRE 623	Financial Management	
FIRE 635	Investments and Security Analysis	
FIRE 639	International Finance	
FIRE 650	Derivatives	
FIRE 654	Short-term Financial Management	
MGMT 637	Advanced Human Resource Management	

MGMT 641	Leading People and Organizations	
MGMT 654	Negotiations	
MGMT 655	Entrepreneurship	
MKTG 673	Marketing Research	
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 606	Supply Chain Innovation	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Austen Gouldman
Director, graduate programs
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Phone: (804) 828-4622

Additional contact
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Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/master-of-accountancy (http://business.vcu.edu/graduate-studies/master-of-accountancy)

Department of Economics

Leslie S. Stratton, Ph.D.
Professor and chair

business.vcu.edu/departments-and-centers/economics (http://business.vcu.edu/departments-and-centers/economics)

The Department of Economics provides instruction for degree programs at the baccalaureate, master's and doctoral level. The faculty works to develop in students the ability to use economic reasoning to understand and analyze business and economic phenomena and policies — the skills needed for careers in a rapidly changing world. To enhance the educational process and to broaden the frontiers of knowledge, faculty members conduct basic and applied research and provide academic and professional service to the university and professional communities.

- Economics, Master of Arts (M.A.) (p. 451)
- Economics, Master of Arts (M.A.) with a concentration in financial economics (p. 453)
- Economics, Master of Arts (M.A.) with a concentration in health economics (p. 454)
- Economics, Master of Arts (M.A.) with a concentration in statistics (p. 456)

Economics, Master of Arts (M.A.)

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Arts in Economics is designed to enhance the student's abilities to use economic modeling to conduct applied analytical and econometric research. Students in this program are expected to demonstrate competence over a rigorous and current core curriculum in microeconomic and macroeconomic theory and in econometrics.

Graduates of the program should be well-qualified to conduct applied economic analysis in either a government or corporate research setting. The program also is an excellent preparation for entry into a doctoral program in economics or finance.

Student learning outcomes

1. Students will be able to use a standard macroeconomic model to analyze the impact of a policy action on major macroeconomic variables.
2. Students will be able to use advanced microeconomic models to analyze the behavior of consumers and firms and the impact of public policy on economic welfare.
3. Students will understand the properties of the ordinary least squares estimator under different assumptions about the data-generating process encountered in economics.
4. Students will understand circumstances in which estimation of an econometric time series model is appropriate.
5. Students will understand the application of models appropriate for analysis of limited dependent variables encountered in economics.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the M.A. in Economics degree requires a minimum of 30 credit hours including six core courses in economics and four approved electives.

Prerequisite and/or foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. This determination is made by the faculty adviser at the time of admission.

Prerequisite undergraduate course

Course	Title	Hours
MATH 200	Calculus with Analytic Geometry	4
or ECON 403	Introduction to Mathematical Economics	

Curriculum requirements

Course	Title	Hours
Foundation courses		
ECON 500	Concepts in Economics	3
ECON 501	Introduction to Econometrics	3
Required courses		
ECON 604	Advanced Microeconomic Theory	3
ECON 607	Advanced Macroeconomic Theory	3
ECON 612	Econometrics	3
ECON 614	Mathematical Economics	3
ECON 641	Econometric Time-series Analysis	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
Approved electives		12
ECON 600:609		
ECON 616:699		
FIRE 600:699		
HADM 602	Health System Organization, Financing and Performance	
HADM 610	Health Analytics and Decision Support	
HCPR 601	Introduction to Health Policy	
HCPR 701:734		
INFO 614	Data Mining	
MKTG 600:699		
MGMT 600:699		
OPER 636	Machine Learning Algorithms	
OPER 643	Decision and Risk Analysis	
OPER 647	Multiobjective Decision Analysis	
PADM 601	Principles of Public Administration	
PADM 603	Politics and Economics	
PADM 609	Financial Management in Government	
PADM 622	Public Sector Budgeting	
PADM 625	Public Policy Analysis	
SCMA 600:699		
STAT/BIOS 513	Mathematical Statistics I	
STAT/BIOS 514	Mathematical Statistics II	
STAT 600:699		

Total graduate credit hours required (minimum) 30 (36 if both graduate foundation courses are required)

Graduate program director
Austen Gouldman
Director, graduate programs
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Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/master-of-arts-in-economics (http://business.vcu.edu/graduate-studies/master-of-arts-in-economics)

Economics, Master of Arts (M.A.) with a concentration in financial economics

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Arts in Economics is designed to enhance the student's abilities to use economic modeling to conduct applied analytical and econometric research. Students in this program are expected to demonstrate competence over a rigorous and current core curriculum in microeconomic and macroeconomic theory and in econometrics.

Graduates of the program should be well-qualified to conduct applied economic analysis in either a government or corporate research setting. The program also is an excellent preparation for entry into a doctoral program in economics or finance.

Student learning outcomes

1. Students will be able to use a standard macroeconomic model to analyze the impact of a policy action on major macroeconomic variables.
2. Students will be able to use advanced microeconomic models to analyze the behavior of consumers and firms and the impact of public policy on economic welfare.
3. Students will understand the properties of the Ordinary Least Squares estimator under different assumptions about the data generating process encountered in economics.
4. Students will understand circumstances in which estimation of an econometric time series model is appropriate.
5. Students will understand the application of models appropriate for the analysis of limited dependent variables encountered in economics.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the M.A. in Economics degree with a concentration in financial economics requires a minimum of 30 credit hours of 600-level course work. The 30 hours must include seven core courses and three restricted electives.

Prerequisite and/or foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. This determination is made by the faculty adviser at the time of admission.

Prerequisite undergraduate course

Course	Title	Hours
MATH 200	Calculus with Analytic Geometry	4
or ECON 403	Introduction to Mathematical Economics	

Curriculum requirements

Course	Title	Hours
Foundation courses		
ECON 500	Concepts in Economics	3
ECON 501	Introduction to Econometrics	3
FIRE 520	Financial Concepts of Management	3
Required courses		
ECON 604	Advanced Microeconomic Theory	3
ECON 607	Advanced Macroeconomic Theory	3
ECON 612	Econometrics	3
ECON 614	Mathematical Economics	3
ECON 617	Financial Markets	3
ECON 641	Econometric Time-series Analysis	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
Restricted electives		
FIRE 623	Financial Management	3
FIRE 635	Investments and Security Analysis	3
FIRE 650	Derivatives	3

Total graduate credit hours required (minimum) 30 (39 if all foundation courses are required)

Graduate program director
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Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/master-of-arts-in-economics (http://business.vcu.edu/graduate-studies/master-of-arts-in-economics)

Economics, Master of Arts (M.A.) with a concentration in health economics

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Graduates of the Master of Arts in Economics program will have the knowledge and experience to qualify for a wide and rapidly expanding range of analyst positions in the private or public sectors. Graduates will be particularly well-suited for positions requiring modeling skills and substantial experience in the analysis and interpretation of firm-level, industry or macroeconomic data. A unique feature of the program is a three-course core sequence in applied econometrics. These courses emphasize the application of modeling techniques and data analysis though the introduction of cases and projects. Through these courses, students acquire a working knowledge of up-to-date powerful statistical software and broad experience in working with a variety of real data sets. The concentration in health economics will allow students with particular interest in the health sector and in health policy issues to specialize in health economics, a topic currently quite relevant.

Graduates of the M.A.in Economics with a concentration in health economics, in addition to holding highly competitive terminal credentials as analysts, will find the program to be an outstanding bridge to doctoral work in programs such as the Ph.D. in Healthcare Policy and Research offered in the School of Medicine at VCU.

Student learning outcomes

1. Students will be able to use a standard macroeconomic model to analyze the impact of a policy action on major macroeconomic variables.
2. Students will be able to use advanced microeconomic models to analyze the behavior of consumers and firms and the impact of public policy on economic welfare.
3. Students will understand the properties of the Ordinary Least Squares estimator under different assumptions about the data generating process encountered in economics.
4. Students will understand circumstances in which estimation of an econometric time series model is appropriate.
5. Students will understand the application of models appropriate for the analysis of limited dependent variables encountered in economics.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the M.A. in Economics with a concentration in health economics requires 30 credit hours of 600-level courses. The 30 hours must include six core courses and four restricted electives.

Prerequisite and/or foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. This determination is made by the faculty adviser at the time of admission.

Prerequisite undergraduate course

Course	Title	Hours
MATH 200	Calculus with Analytic Geometry	4
or ECON 403	Introduction to Mathematical Economics	

Curriculum requirements

Course	Title	Hours
Foundation courses		
ECON 500	Concepts in Economics	3
ECON 501	Introduction to Econometrics	3
Required courses		
ECON 604	Advanced Microeconomic Theory	3
ECON 607	Advanced Macroeconomic Theory	3
ECON 612	Econometrics	3
ECON 614	Mathematical Economics	3
ECON 641	Econometric Time-series Analysis	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
Restricted electives		
Select four of the following:		12
HADM 602	Health System Organization, Financing and Performance	
HADM 606	Health Care Managerial Accounting	
HADM 607	Financial Management in Health Organizations	
HADM 610	Health Analytics and Decision Support	
HADM 615	Health Care Politics and Policy	
HADM/ECON 624	Health Economics	
HCPR 601	Introduction to Health Policy	
HCPR 703	Health Economics: Theory and Principles	
HCPR 733	Statistical Methods in Analysis of Healthcare Research	

Total graduate credit hours required (minimum) 30 (36 if all foundation courses are required)

Graduate program director
Austen Gouldman
Director, graduate programs
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Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/master-of-arts-in-economics (http://business.vcu.edu/graduate-studies/master-of-arts-in-economics)

Economics, Master of Arts (M.A.) with a concentration in statistics

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Arts in Economics is designed to enhance the student's abilities to use economic modeling to conduct applied analytical and econometric research. Students in this program are expected to demonstrate competence over a rigorous and current core curriculum in microeconomic and macroeconomic theory and in econometrics.

Graduates of the program should be well-qualified to conduct applied economic analysis in either a government or corporate research setting. The program also is an excellent preparation for entry into a doctoral program in economics or finance.

Student learning outcomes

1. Students will be able to use a standard macroeconomic model to analyze the impact of a policy action on major macroeconomic variables.
2. Students will be able to use advanced microeconomic models to analyze the behavior of consumers and firms and the impact of public policy on economic welfare.
3. Students will understand the properties of the ordinary least squares estimator under different assumptions about the data-generating process encountered in economics.
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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the M.A. in Economics degree with a concentration in statistics requires a minimum of 30 credit hours of 500- and 600-level course work. The 30 hours must include eight core courses, one restricted elective and one additional approved elective.

Prerequisite and/or foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. This determination is made by the faculty adviser at the time of admission.

Prerequisite undergraduate course

Course	Title	Hours
MATH 307	Multivariate Calculus	4

Curriculum requirements

Course	Title	Hours
Foundation courses		
ECON 500	Concepts in Economics	3
ECON 501	Introduction to Econometrics	3
Required courses		
ECON 604	Advanced Microeconomic Theory	3
ECON 607	Advanced Macroeconomic Theory	3
ECON 612	Econometrics	3
ECON 614	Mathematical Economics	3
ECON 641	Econometric Time-series Analysis	3
ECON 642	Panel and Nonlinear Methods in Econometrics	3
STAT/BIOS 513	Mathematical Statistics I	3
STAT/BIOS 514	Mathematical Statistics II	3
Statistics elective		
Select one course from the list of approved statistics electives below.		3
Regression models		
STAT 546	Linear Models	
STAT 623	Discrete Multivariate Analysis	
STAT 643	Applied Linear Regression	
STAT 744	Regression II	
Design of experiments		
STAT 642	Design and Analysis of Experiments I	
STAT 650	Design and Analysis of Response Surface Experiments	
STAT 742	Design and Analysis of Experiments II	
Time series		
STAT 613	Stochastic Processes	
STAT 675	Time Series Analysis I	
Machine learning and big data		
STAT/OPER 636	Machine Learning Algorithms	
STAT/OPER 736	Mathematics of Knowledge and Search Engines	
Bayesian analysis		
STAT 645	Bayesian Decision Theory	
STAT 745	Advanced Bayesian Statistics	
Quality control		
STAT/OPER 648	Systems Reliability Analysis	
STAT/OPER 649	Statistical Quality Control	
Approved elective		
Select additional course from the list of approved statistics electives above, or any course from the list of approved electives below.		3
ECON 600:609		
ECON 612:697		
FIRE 600:699		
HADM 602	Health System Organization, Financing and Performance	
HADM 610	Health Analytics and Decision Support	
HCPR 601	Introduction to Health Policy	
INFO 614	Data Mining	
MKTG 600:699		
MGMT 600:699		
PADM 601	Principles of Public Administration	
PADM 603	Politics and Economics	
PADM 609	Financial Management in Government	
PADM 622	Public Sector Budgeting	
PADM 625	Public Policy Analysis	
SCMA 600:699		

Total graduate credit hours required (minimum) 30 (36 if all foundation courses are required)

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Program website: business.vcu.edu/graduate-studies/master-of-arts-in-economics (http://business.vcu.edu/graduate-studies/master-of-arts-in-economics)

Department of Finance, Insurance and Real Estate

Manu Gupta, Ph.D.
Associate professor and chair

business.vcu.edu/departments-and-centers/finance-insurance-and-real-estate-fire (http://business.vcu.edu/departments-and-centers/finance-insurance-and-real-estate-fire)

The Department of Finance, Insurance and Real Estate delivers knowledge to students in all programs offered by the School of Business and contributes to the expansion of knowledge by engaging in scholarly activity. The department provides core courses as well as majors, minors and concentrations. In addition, the department develops and delivers courses in continuing professional education for practitioners seeking to upgrade their skills and/or attempting to achieve professional certification.

Department of Information Systems

A. James Wynne, Ph.D.
Associate professor and interim chair

business.vcu.edu/departments-and-centers/information-systems (http://business.vcu.edu/departments-and-centers/information-systems)

The Department of Information Systems provides an innovative, high quality curriculum that is recognized nationally and internationally and maintains the ability to rapidly respond to the dynamic, changing needs of the academic discipline, industry and community.

The department offers degree programs at both the undergraduate and graduate level, as well as continuing education programs that support alumni and the community. Additionally, courses in information systems are offered to meet the needs of students in other curricula offered by the university as well as those who are seeking to enhance their knowledge of information systems.

Departmental faculty offers expertise in information technology and has wide-ranging research and teaching interests. As part of the department, the Information Systems Research Institute provides opportunities for sponsored research, innovative teaching initiatives and faculty development.

Traditional program options

- Computer and Information Systems Security, Master of Science (M.S.) (p. 458)
- Information Systems, Master of Science (M.S.) (p. 460)
- Information Systems, Master of Science (M.S.) with a concentration in health care management (p. 462)
- Information Systems, Master of Science (M.S.) with a concentration in information risk, security and assurance (p. 464)
- Information Systems, Master of Science (M.S.) with a concentration in information risk, security and assurance with Christ University in Bangalore, India (p. 466)

Executive program option

- Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive] (p. 468)

Combined/dual degree programs

- Business Administration, Master of (M.B.A.)/Information Systems, Master of Science (M.S.) [combined] (p. 469)
- Business Administration, Master of (M.B.A.)/Information Systems, Master of Science in (M.S.) with a concentration in information technology management [Executive] [combined] (p. 471)
- Business Administration, Master of (M.B.A.) [Executive]/Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive] [combined] (p. 473)
- Health Administration, Master of (M.H.A.)/Information Systems, Master of Science (M.S.) [combined] (p. 475)

Computer and Information Systems Security, Master of Science (M.S.) [School of Business]

Program mission

The Master of Science in Computer and Information Systems Security provides for the scholarly and professional needs of several groups who have either accepted or are keen to take on the challenge of protecting information resources of firms and society at large.

Program goal

Graduates of this program are expected to take on leadership positions, including as chief security officer, in computer and information systems security in organizations. VCU's program takes a broad interdisciplinary approach to computer and information systems security that will help develop the student's ability to see the larger organizational, social, political, ethical and economic aspects of information security.

Student learning outcomes

Graduates of the program will be:

1. Prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations
2. Familiar with state-of-the-art security technologies and best practices

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE or GMAT
	Spring	Nov 1	TOEFL for international students

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

The Master of Science in Computer and Information Systems Security, jointly offered by the Department of Computer Science in the College of Engineering and the Department of Information Systems in the School of Business, is designed primarily for students interested in professional roles in business, industry or government. Program graduates will serve as leaders within the computer and information systems security community and as strategic partners within the enterprises in which they work. They will stay attuned to, and anticipate changes in, the computer and information systems security environment and ensure that security solutions create a sound, competitive, cost-effective advantage for the enterprise.

Graduates of the program will be prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations and will be familiar with state-of-the-art security technologies and best practices. The program takes a broad interdisciplinary approach to computer and information systems security that will help students develop the ability to see the larger organization and social, political, ethical and economic aspects of information security, as well as offering a unique graduate-level curriculum that is both technically and managerially oriented.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the M.S. in Computer and Information Systems Security requires 30 graduate credit hours, including a core curricular component and an elective component. The elective component consists of three courses chosen by the student and selected from CISS course offerings or, with the approval of the program co-directors, from courses offered by the departments of Computer Science, Information Systems, Criminal Justice and Forensic Science.

Curriculum requirements

Students with an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems should be adequately prepared for the graduate curriculum. Students from other academic backgrounds may need to complete undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

Prerequisite courses

Course	Title	Hours
CMSC 312	Introduction to Operating Systems	3
or INFO 361	Systems Analysis and Design	
CMSC 355	Software Engineering: Specification and Design	3
or INFO 370	Fundamentals of Data Communications	
CMSC 401	Algorithm Analysis with Advanced Data Structures	3
CMSC 508	Database Theory	3
or INFO 364	Database Systems	
MATH 211	Mathematical Structures	3
or CMSC 302	Introduction to Discrete Structures	
STAT 212	Concepts of Statistics	3

Curriculum

Course	Title	Hours
Core component		
CISS/CMSC 618	Database and Application Security	3
CISS/CMSC 622	Network and Operating Systems Security	3
CISS 624/CMSC 620	Applied Cryptography	3
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	3
CISS/INFO 644	Principles of Computer and Information Systems Security	3
INFO 646	Security Policy Formulation and Implementation	3
Elective component		
Choose four of the following courses. Students must select a minimum of one CMSC and one INFO course		12
CMSC 502	Parallel Algorithms	
CMSC 506	Computer Networks and Communications	
CMSC 525	Introduction to Software Analysis, Testing and Verification	
CMSC 612	Game Theory and Security	
CMSC 691	Special Topics in Computer Science	
INFO 609	Data-centric Re-engineering Analysis/Planning	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 691	Topics in Information Systems	
Total Hours		30

Total graduate credit hours required (minimum) 30

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Program websites: computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security (http://computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security) and business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security (http://business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security)

Information Systems, Master of Science (M.S.)

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Information Systems program is designed to prepare students for specialized roles using information systems to support organizations. The program is intended to provide a graduate-level, business-technology-oriented curriculum that focuses on the design and development of information systems to solve real-world problems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing systems using state-of-the-art technologies within organizations.

Student learning outcomes

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

Students applying to the Master of Science in Information Systems must show evidence of competence in selected prerequisite areas of information systems including: application programming, systems analysis and design, database, telecommunications and hardware/software. Evidence of this competence may include formal course work, comparable training within a work environment or significant, relevant and recent work experience in the field. Students enrolled as majors in the program who do not have a formal background or equivalent training must take the appropriate undergraduate courses to satisfy the prerequisites prior to taking master's program courses. Students without an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems will likely need to complete several undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

In addition to the VCU Graduate School graduation requirements (p. 31), students who do not have a business degree must complete a minimum of two 500-level foundation courses (6 credit hours). Foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. Students who are required to take foundation courses may do so after admission. The foundation courses required will vary depending upon the student's background, career interests and the chosen area of specialization. Students applying to the program should consult with the master's program adviser to determine the foundation courses required for a particular area.

Prerequisite undergraduate courses

Course	Title	Hours
INFO 202	Introduction to E-business Technologies	3
INFO 300	Information Technology Infrastructure	3
INFO 350	Programming	3
INFO 361	Systems Analysis and Design	3
INFO 364	Database Systems	3
INFO 370	Fundamentals of Data Communications	3
MATH 211	Mathematical Structures	3
A course in calculus		

Curriculum requirements

Course	Title	Hours
Foundation courses		
0-6 credits; may be waived for demonstrated equivalence.		
ACCT 507	Fundamentals of Accounting	
or ECON 500	Concepts in Economics	
or FIRE 520	Financial Concepts of Management	
SCMA 524	Statistical Fundamentals for Business Management	
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO 640	Information Systems Management	3
Information system electives		
Select four to six of the following:		12-18
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	
INFO 609	Data-centric Re-engineering Analysis/Planning	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO/CISS 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 646	Security Policy Formulation and Implementation	
INFO 658	Securing the Internet of Things	
INFO 664	Information Systems for Business Intelligence	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
Other approved electives		
A maximum of two non-INFO electives may be completed from the preapproved list below.		0-6
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	

Total graduate credit hours required (minimum) 30 (36 if all foundation courses are taken)

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Program website: business.vcu.edu/graduate-studies/ms-in-information-systems (http://business.vcu.edu/graduate-studies/ms-in-information-systems)

Information Systems, Master of Science (M.S.) with a concentration in health care management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Information Systems program is designed to prepare students for specialized roles using information systems to support organizations. The program is intended to provide a graduate-level, business-technology-oriented curriculum that focuses on the design and development of information systems to solve real-world problems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing systems using state-of-the-art technologies within organizations.

Student learning outcomes

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

Students applying to the Master of Science in Information Systems must show evidence of competence in selected prerequisite areas of information systems including: application programming, systems analysis and design, database, telecommunications and hardware/software. Evidence of this competence may include formal course work, comparable training within a work environment or significant, relevant and recent work experience in the field. Students enrolled as majors in the program who do not have a formal background or equivalent training must take the appropriate undergraduate courses to satisfy the prerequisites prior to taking master's program courses. Students without an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems will likely need to complete several undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

In addition to the VCU Graduate School graduation requirements (p. 31), students who do not have a business degree must complete a minimum of two 500-level foundation courses (6 credit hours). Foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. Students who are required to take foundation courses may do so after admission. The foundation courses required will vary depending upon the student's background, career interests and the chosen area of specialization. Students applying to the program should consult with the master's program adviser to determine the foundation courses required for a particular area.

Prerequisite undergraduate courses

Course	Title	Hours
INFO 202	Introduction to E-business Technologies	3
INFO 300	Information Technology Infrastructure	3
INFO 350	Programming	3
INFO 361	Systems Analysis and Design	3
INFO 364	Database Systems	3
INFO 370	Fundamentals of Data Communications	3
MATH 211	Mathematical Structures	3
A course in calculus		

Curriculum requirements

Course	Title	Hours
Foundation courses		
0-6 credits; may be waived for demonstrated equivalence.		
ACCT 507	Fundamentals of Accounting	
or ECON 500	Concepts in Economics	
or FIRE 520	Financial Concepts of Management	
SCMA 524	Statistical Fundamentals for Business Management	
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO 640	Information Systems Management	3
Information system electives		
Select four to six of the following:		12-18
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	
INFO 609	Data-centric Re-engineering Analysis/Planning	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO/CISS 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 646	Security Policy Formulation and Implementation	
INFO 658	Securing the Internet of Things	
INFO 664	Information Systems for Business Intelligence	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
Other approved electives		
A maximum of two non-INFO electives may be completed from the preapproved list below.		0-6
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Required concentration courses		
FMBA 614	Health Care Management I: National Perspective	3
FMBA 615	Health Care Management II: Employer's Perspective	3
FMBA 616	Health Care Management III: Industry Perspective	3

Total graduate credit hours required (minimum) 39 (45 if all foundation courses are taken)

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Program website: business.vcu.edu/graduate-studies/ms-in-information-systems (http://business.vcu.edu/graduate-studies/ms-in-information-systems)

Information Systems, Master of Science (M.S.) with a concentration in information risk, security and assurance

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Information Systems program is designed to prepare students for specialized roles using information systems to support organizations. The program is intended to provide a graduate-level, business-technology-oriented curriculum that focuses on the design and development of information systems to solve real-world problems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing systems using state-of-the-art technologies within organizations.

The information risk, security and assurance concentration within the degree is designed primarily for students interested in professional roles in business, industry or government. Program graduates will serve as leaders within the risk, security and assurance community and as strategic partners with the enterprise in which they work. They will stay attuned to and anticipate changes in the risk, security and assurance environment and ensure that security solutions create a sound, competitive and cost-effective advantage for the enterprise.

Student learning outcomes

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

Students applying to the Master of Science in Information Systems must show evidence of competence in selected prerequisite areas of information systems including: application programming, systems analysis and design, database, telecommunications and hardware/software. Evidence of this competence may include formal course work, comparable training within a work environment or significant, relevant and recent work experience in the field. Students enrolled as majors in the program who do not have a formal background or equivalent training must take the appropriate undergraduate courses to satisfy the prerequisites prior to taking master's program courses. Students without an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems will likely need to complete several undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

In addition to the VCU Graduate School graduation requirements (p. 31), students who do not have a business degree must complete a minimum of two 500-level foundation courses (6 credit hours). Foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. Students who are required to take foundation courses may do so after admission. The foundation courses required will vary depending upon the student's background, career interests and the chosen area of specialization. Students applying to the program should consult with the master's program adviser to determine the foundation courses required for a particular area.

Prerequisite undergraduate courses

Course	Title	Hours
INFO 202	Introduction to E-business Technologies	3
INFO 300	Information Technology Infrastructure	3
INFO 350	Programming	3
INFO 361	Systems Analysis and Design	3
INFO 364	Database Systems	3
INFO 370	Fundamentals of Data Communications	3
MATH 211	Mathematical Structures	3
A course in calculus		

Curriculum requirements

Course	Title	Hours
Foundation courses		
0-6 credits; may be waived for demonstrated equivalence.		
ACCT 507	Fundamentals of Accounting	
or ECON 500	Concepts in Economics	
or FIRE 520	Financial Concepts of Management	
SCMA 524	Statistical Fundamentals for Business Management	
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO 640	Information Systems Management	3
Concentration courses		
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	3
INFO 614	Data Mining	3
INFO/CISS 644	Principles of Computer and Information Systems Security	3
INFO 646	Security Policy Formulation and Implementation	3
INFO 658	Securing the Internet of Things	3
Approved elective		
Select one of the following:		3
INFO 609	Data-centric Re-engineering Analysis/Planning	
INFO 611	Data Re-engineering	
INFO/CISS 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO 664	Information Systems for Business Intelligence	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		30

Total graduate credit hours required (minimum) 30 (36 if all foundation courses are taken)

Graduate program director
Austen Gouldman
Director, graduate programs
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Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/ms-in-information-systems (http://business.vcu.edu/graduate-studies/ms-in-information-systems)

Information Systems, Master of Science (M.S.) with a concentration in information risk, security and assurance with Christ University in Bangalore, India

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Students may choose a curriculum with no concentration or a concentration in information risk, security and assurance. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS systems using state-of-the-art technologies within organizations.

The information risk, security and assurance concentration within the degree is designed primarily for students interested in professional roles in business, industry or government. Program graduates will serve as leaders within the risk, security and assurance community and as strategic partners with the enterprise in which they work. They will stay attuned to and anticipate changes in the risk, security and assurance environment and ensure that security solutions create a sound, competitive and cost-effective advantage for the enterprise.

Student learning outcomes

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
	Summer	Mar 1	

The VCU School of Business and Christ University in Bangalore, India have partnered to provide students with an opportunity to study at two universities and earn two degrees. Students who have already been admitted to the Christ University Master of Business Administration program are invited to apply to the VCU Master of Science in Information Systems with a concentration in information risk, security and assurance.

Students satisfy the master's foundation course requirements during the first year while in the Christ University M.B.A. program and then complete the 10 required VCU courses need for the Master of Science in Information Systems with a concentration in information risk, security and assurance. These courses are taken primarily at the VCU Monroe Park Campus and are designed to be completed in one calendar year.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business administration must submit an up-to-date resume.

Degree requirements

Students applying to the Master of Science in Information Systems must show evidence of competence in selected prerequisite areas of information systems including: application programming, systems analysis and design, database, telecommunications and hardware/software. Evidence of this competence may include formal course work, comparable training within a work environment or significant, relevant and recent work experience in the field. Students enrolled as majors in the program who do not have a formal background or equivalent training must take the appropriate undergraduate courses to satisfy the prerequisites prior to taking master's program courses. The required undergraduate courses are:

Course	Title	Hours
INFO 300	Information Technology Infrastructure	3
INFO 350	Programming	3
INFO 360	Business Information Systems	3
INFO 361	Systems Analysis and Design	3
INFO 370	Fundamentals of Data Communications	3
INFO 364	Database Systems	3
A course in calculus		

In addition to the VCU Graduate School graduation requirements (p. 31), students who do not have a business degree must complete a minimum of four 500-level foundation courses (12 credit hours). Foundation courses may be waived for students who present satisfactory equivalent preparation at either the undergraduate or graduate level. Students who are required to take foundation courses may do so after admission. The foundation courses required will vary depending upon the student's background, career interests and the chosen area of specialization. Students applying to the program should consult with the master's program adviser to determine the foundation courses required for a particular area.

Curriculum requirements

Course	Title	Hours
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO 640	Information Systems Management	3
Concentration courses		
CISS 634	Ethical, Social and Legal Issues in Computer and Information Systems Security	3
INFO 614	Data Mining	3
INFO/CISS 644	Principles of Computer and Information Systems Security	3
INFO 646	Security Policy Formulation and Implementation	3
INFO 658	Securing the Internet of Things	3
Approved elective		
Select one from the following:		3
INFO 609	Data-centric Re-engineering Analysis/Planning	
INFO 611	Data Re-engineering	
INFO/CISS 616	Data Warehousing	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO 664	Information Systems for Business Intelligence	
INFO 690	Research Seminar in Information Systems	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 632	Statistical Analysis and Modeling	
SCMA 643	Applied Multivariate Methods	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
Austen Gouldman
Director, graduate programs
Email: gouldmana@vcu.edu
Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/ms-in-information-systems (http://business.vcu.edu/graduate-studies/ms-in-information-systems)

Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS systems using state-of-the-art technologies within organizations.

Student learning outcomes

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Spring	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in information systems must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 30 graduate credit hours.

The Executive Master of Science in Information Systems with a concentration in information technology management provides an opportunity for current information technology professionals and business managers to receive the necessary preparation to move into IT management roles. Participants gain a wide range of new skills and knowledge by combining course work with their day-to-day professional activities. The program is targeted to rising business executives, entrepreneurs and information systems professionals. The program differs from the regular M.S. in Information Systems program in that it is offered in a weekend format, with students meeting for classes on alternate weekends throughout the calendar year. The lockstep program consists of 10 required courses.

Curriculum requirements

Course	Title	Hours
ISTM 671	Organizational Culture and Team Building	3
ISTM 672	Information Systems Management	3
ISTM 673	Analysis and Decisions	3
ISTM 674	Emerging Technologies	3
ISTM 675	IS Planning and Project Management	3
ISTM 676	Information Systems Assurance and Security Management	3
ISTM 677	Structuring Information for Decision Making	3
ISTM 678	IS in the Digital Economy	3
ISTM 679	Enterprise Information Systems	3
ISTM 691	Topics in IT Management	3
Total Hours		30

Total graduate credit hours required (minimum) 30

Graduate program director
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Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/executive-ms-in-is---it-management (http://business.vcu.edu/graduate-studies/executive-ms-in-is---it-management)

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science (M.S.) [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Master of Business Administration

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

An M.B.A. from VCU benefits students at various points in their careers. Individuals who have recently received their baccalaureate degrees may choose to refine their business skills while their undergraduate training is fresh. Individuals with work experience often find that an M.B.A. is the key to rapid promotion or a career change. Finally, an M.B.A. from VCU meets the needs of students who recognize that the best preparation for an uncertain future is continuous learning.

Master of Science in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles using information systems to support organizations. The program is intended to provide a graduate-level, business-technology-oriented curriculum that focuses on the design and development of information systems to solve real-world problems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing systems using state-of-the-art technologies within organizations.

Student learning outcomes

For M.B.A. graduates

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.

7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

For M.S. in Information Sciences graduates

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S. and M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the combined Master of Business Administration and Master of Science in Information Systems program must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students can earn both M.B.A. and M.S. in Information Systems degrees by having 12 credit hours counted toward both degrees.

Students in the combined degree program will follow the same schedule as regular M.B.A. students, including the two lockstep semesters. To get both degrees, students will take all foundation courses required for the M.B.A. (unless waived), all nine core courses required for the M.B.A. and nine additional courses in the M.S. in Information Systems program, including INFO 610, INFO 620 and INFO 630. Students whose undergraduate degrees are not in information systems may also be required to take additional undergraduate prerequisite courses before taking the graduate information systems courses, as determined by the program adviser. The INFO 661 course taken for the M.B.A. will substitute for INFO 640, normally required for the M.S. in Information Systems degree, and three of the additional information systems courses also will count toward the normally required three elective courses in the M.B.A. program.

One of the information systems courses must have substantial global, entrepreneurial and/or experiential components. The six information systems courses to be taken in addition to INFO 661, INFO 664, INFO 610,

INFO 620 and INFO 630 must be approved by the program adviser, and would normally be selected to satisfy one of the M.S. in Information Systems concentrations.

Curriculum requirements

Course	Title	Hours
Foundation courses (not included in 54 hours required for combined degree program)		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
MGMT 540	Management Theory and Practice	3
MKTG 570	Concepts and Issues in Marketing	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 530	Fundamentals of the Legal Environment of Business	3
Total Hours		21

M.B.A. course work

Course	Title	Hours
Advanced courses		
Each student must begin the advanced portion of the program with the courses below in each of the first two semesters. Full-time students will take additional courses from the remainder of the advanced program.		
Semester one (to be taken at the same time)		
ECON 610	Managerial Economics	3
MGMT 641	Leading People and Organizations	3
Semester two		
FIRE 623	Financial Management	3
Remainder of the advanced program		
ACCT 608	Managerial Accounting Concepts	3
INFO 661	Information Systems for Managers	3
INFO 664	Information Systems for Business Intelligence	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 675	Operations Management	3
Total Hours		27

M.S. in Information Systems course work

Course	Title	Hours
Core courses		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
Electives		
Select six of the following:		18
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO/CISS 616	Data Warehousing	
INFO 622	Internet Security Management	
INFO 632	Business Process Engineering	
INFO 641	Strategic Information Systems Planning	
INFO 642	Decision Support and Intelligent Systems	
INFO 643	Information Technology Project Management	
INFO/CISS 644	Principles of Computer and Information Systems Security	
INFO 646	Security Policy Formulation and Implementation	
INFO 654	Systems Interface Design	
INFO 658	Securing the Internet of Things	
INFO 691	Topics in Information Systems	
INFO 693	Field Project in Information Systems	
INFO 697	Guided Study in Information Systems	
Total Hours		27

Total graduate credit hours required (minimum) 54

Students in the combined program who wish to have an M.B.A. concentration other than information resources management would need to complete an additional three courses for the concentration area.

Graduate program director
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Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/combined-mbams-in-information-systems (http://business.vcu.edu/graduate-studies/combined-mbams-in-information-systems)

Business Administration, Master of (M.B.A.)/Information Systems, Master of Science in (M.S.) with a concentration in information technology management [Executive] [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Master of Business Administration

The purpose of the Master of Business Administration program at VCU is to prepare individuals for the responsibilities of management. As students at VCU, individuals will learn the functions and techniques of effective management. The student also will come to understand the environmental and economic factors that affect decision-making in

organizations. In short, the student will know what to do as future events unfold that affect his/her firm or organization.

An M.B.A. from VCU benefits students at various points in their careers. Individuals who have recently received their baccalaureate degrees may choose to refine their business skills while their undergraduate training is fresh. Individuals with work experience often find that an M.B.A. is the key to rapid promotion or a career change. Finally, an M.B.A. from VCU meets the needs of students who recognize that the best preparation for an uncertain future is continuous learning.

Master of Science in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Students may choose a curriculum with no concentration or a concentration in information risk, security and assurance. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS systems using state-of-the-art technologies within organizations.

Student learning outcomes

For M.B.A. graduates

1. Students should be able to demonstrate the capacity to apply business knowledge in new and unfamiliar circumstances.
2. Students should be able to demonstrate the ability to work in teams and other groups.
3. Students should understand and be able to develop the ethical and social responsibilities of organizations.
4. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
5. Students should be able to identify and understand major issues faced by organizations with evolving information technology and investigate issues and challenges faced by managers with changes in information technology.
6. Students should be able to describe the factors involved in key operation decisions and to apply appropriately techniques that provide insight and structure for management decision-making.
7. Graduates of the program should be able to critically evaluate and use accounting and other information for managerial decision-making.
8. Graduates should be able to evaluate marketing programs.
9. Students should be able to think critically and systematically about financial issues in businesses to develop techniques to analyze these issues numerically.
10. Graduates of the program should be able to develop an analytical framework for identifying the objectives of the firm and to provide some tools for evaluating the firm's performance.

For M.S. in Information Sciences graduates

1. Graduates should be capable of communicating and networking effectively within their profession and within their organizations, serving the profession by applying this knowledge broadly and maintaining key technical expertise in order to sustain required levels of competitiveness.
2. Graduates must have an understanding of information technology as it applies to business contexts and the skill to apply this technology effectively in specific circumstances.
3. Graduates must be able to develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations.
4. Graduates must be able to develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
M.S.	Spring only	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the combined Master of Business Administration and Executive Master of Science in Information Systems with a concentration in information technology management program must submit an up-to-date resume.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students can earn both M.B.A. and M.S. in Information Systems degrees by having 12 credit hours counted toward both degrees, thus requiring only 54 credit hours total of advanced course work (not counting foundation courses), rather than the 36 and 30 credit hours normally required for the two degrees.

To obtain both degrees, students will complete the entire 30 credit-hour information system master's program plus six M.B.A. core courses (ECON 610, FIRE 623, ACCT 608, MGMT 642, SCMA 675 and MKTG 671) plus two elective courses. Students must also complete any designated required courses. The course ISTM 671 will substitute for MGMT 641; ISTM 672 will substitute for INFO 661; and ISTM 677 will substitute for INFO 664. ISTM 673 will count toward one of the three required M.B.A. elective courses.

Curriculum requirements

Course	Title	Hours
Foundation courses (Not included in 54 hours required for combined degree program.)		
ACCT 507	Fundamentals of Accounting	3
ECON 500	Concepts in Economics	3
FIRE 520	Financial Concepts of Management	3
MGMT 540	Management Theory and Practice	3
MKTG 570	Concepts and Issues in Marketing	3
SCMA 524	Statistical Fundamentals for Business Management	3
SCMA 530	Fundamentals of the Legal Environment of Business	3
Total Hours		21

M.B.A. course work

Course	Title	Hours
Advanced core courses		
ACCT 608	Managerial Accounting Concepts	3
ECON 610	Managerial Economics	3
FIRE 623	Financial Management	3
MGMT 642	Business Policy and Strategy	3
MKTG 671	Marketing Management	3
SCMA 675	Operations Management	3
Electives (two)		6
Total Hours		24

M.S. in Information Systems course work

Course	Title	Hours
ISTM 671	Organizational Culture and Team Building	3
ISTM 672	Information Systems Management	3
ISTM 673	Analysis and Decisions	3
ISTM 674	Emerging Technologies	3
ISTM 675	IS Planning and Project Management	3
ISTM 676	Information Systems Assurance and Security Management	3
ISTM 677	Structuring Information for Decision Making	3
ISTM 678	IS in the Digital Economy	3
ISTM 679	Enterprise Information Systems	3
ISTM 691	Topics in IT Management	3
Total Hours		30

Total graduate credit hours required (minimum) 54

Students in the combined program who wish to have an M.B.A. concentration other than information resources management would need to complete an additional three courses for the concentration area.

Graduate program director
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Phone: (804) 828-4622

Program website: business.vcu.edu/graduate-studies/combined-mbams-in-information-systems (http://business.vcu.edu/graduate-studies/combined-mbams-in-information-systems)

Business Administration, Master of (M.B.A.) [Executive]/Information Systems, Master of Science (M.S.) with a concentration in information technology management [Executive] [combined]

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

Executive M.B.A.

VCU's School of Business Executive M.B.A. program provides experienced managers in Virginia and surrounding states with the knowledge and skills needed to solve real-world business problems in today's complex global environment. The Executive M.B.A. program accomplishes this purpose by using a curriculum with an integrated, modular, team-oriented, interdisciplinary approach that constantly challenges students to apply knowledge and skills to new and unfamiliar situations by using a conceptual understanding of relevant business disciplines.

M.S. in Information Systems

The Master of Science in Information Systems program is designed to prepare students for specialized roles in information systems. The program is intended to provide a graduate-level, technically oriented curriculum that focuses on the design and development of information systems to solve real-world problems. The department's curriculum is focused on the rapidly emerging area known as enterprise information systems. Graduates of the program are expected to be able to take significant roles in planning, organizing, managing, designing, configuring and implementing EIS using state-of-the-art technologies within organizations.

Student learning outcomes

Executive M.B.A.

1. Demonstrate the capacity from an executive perspective to integrate knowledge-specific information to different business disciplines in helping teams to solve business problems in new and unfamiliar circumstances
2. Demonstrate communication knowledge and skills in both technical and interpersonal areas
3. Demonstrate an understanding of the ethical and social responsibility of business organizations in the U.S. and in other parts of the world
4. Demonstrate analytic skills using new and unfamiliar data sets

M.S. in Information Systems

Graduates should be able to:

1. Communicate and network effectively within their professions and organizations; serve the profession by applying this knowledge broadly; and maintain key technical expertise in order to sustain required levels of competitiveness
2. Understand information technology as it applies to business contexts and effectively apply this technology in specific circumstances
3. Develop efficient and effective IS solutions using appropriate technologies that can deliver competitive advantages to organizations
4. Develop and incorporate changes in the planning and management of IS resources based on an increased understanding of the dynamic changes in the organization, IS and global environments

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at **business.vcu.edu/graduate-studies/current-graduate-students**.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.B.A./M.S.	Fall	Feb 15 (for early decision)	
		Apr 22 (final decision)	
	Spring	Feb 1	

Admission notes regarding deadline: Students in the Executive M.B.A. program have the option to continue with the Executive M.S. in Information Systems with a concentration in information technology management program after having completed the requirements for the Executive M.B.A. to earn both degrees.

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 60 hours of graduate course work. Students pursuing this dual-degree option will have three courses in the Executive M.S. program waived. These three courses cover the information systems content of the Executive M.B.A. program.

Curriculum requirements

Course	Title	Hours
FMBA 601	Team Building and Leadership (course 1)	3
FMBA 602	Team Building and Leadership (course 2)	3
FMBA 603	Business Foundations (course 1)	3
FMBA 604	Analysis and Decisions (course 1)	3
FMBA 605	Analysis and Decisions (course 2)	3
FMBA 606	Analysis and Decisions (course 3)	3
FMBA 607	Global Challenges (course 1)	3
FMBA 608	Organizational Culture (course 1)	3
FMBA 609	Productivity and Innovation (course 1)	3
FMBA 610	Productivity and Innovation (course 2)	3
FMBA 611	Strategic Management (course 1)	3
FMBA 612	Strategic Management (course 2)	3
FMBA 613	Strategic Management (course 3)	3
Information systems courses		
ISTM 674	Emerging Technologies	3
ISTM 675	IS Planning and Project Management	3
ISTM 676	Information Systems Assurance and Security Management	3
ISTM 677	Structuring Information for Decision Making	3
ISTM 678	IS in the Digital Economy	3
ISTM 679	Enterprise Information Systems	3
ISTM 691	Topics in IT Management	3
Total Hours		60

Total graduate credit hours required (minimum) 60

Graduate program director

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Program website: business.vcu.edu/graduate.html (http://business.vcu.edu/graduate.html)

Health Administration, Master of (M.H.A.)/Information Systems, Master of Science (M.S.) [combined]

Advanced study in health administration and information systems is available through combined degree programs co-sponsored by the Department of Health Administration in the College of Health Professions and the Department of Information Systems in the School of Business.

The combined M.H.A/M.S. program allows students interested in the fields of health management and information technology to earn two highly ranked and relevant master's degrees in just three years, which is the time it usually takes to complete just one of the degrees. The combined degree program is ideal for students who are pursuing careers in health IT management, health IT business consulting or working in the health IT vendor industry.

Applicants for this program are required to meet the admission requirements of each program. For information regarding the dual-degree program, contact the director of the program.

The proposed curriculum allows students to earn both the M.H.A. and the M.S. in Information Systems with a total of 78 credit hours rather than the 89 credit hours that would be required to obtain the degrees separately. The dual-degree option offers this credit-hour efficiency by taking advantage of curricular similarities in the two programs and allowing some courses to count toward both sets of requirements. A total of 12 credit hours will count toward both degrees and the M.H.A. foundation courses will be substituted for the business school foundation course requirements for combined degree students. Students in the combined degree program will follow the same schedule as regular M.H.A. students, including the two lockstep years.

Students will take 51 credit hours of health administration courses required for the M.H.A. and nine additional courses (27 credit hours) in the M.S. in Information Systems program, including INFO 610, INFO 620 and INFO 630. Students whose undergraduate degrees are not in information systems may also be required to take additional undergraduate prerequisite courses before taking the graduate information systems courses, as determined by the program adviser. The HADM 612 course taken for the M.H.A. will substitute for INFO 640, normally required for the M.S. in Information Systems degree, and one of the additional information systems courses will also count toward the elective courses in the M.H.A. program.

A three-credit-hour, 10-week internship is required and must have substantial global, entrepreneurial and/or experiential components related to both degrees. The six information systems courses to be taken in addition to INFO 610, INFO 620 and INFO 630, must be approved by the program adviser and would normally be selected to satisfy one of the M.S. in Information Systems concentrations.

Course	Title	Hours
Courses		
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 607	Financial Management in Health Organizations	3
HADM 608	Seminar in Health Care Finance	3
HADM 609	Managerial Epidemiology	2
HADM 610	Health Analytics and Decision Support	3
HADM 611	Health Care Law and Bioethics	3
HADM 612	Information Systems for Health Care Management	3
HADM 614	Health Care Marketing	3
HADM 615	Health Care Politics and Policy	3
HADM/ECON 624	Health Economics	3
HADM 646	Health Care Organization and Leadership	3
HADM 647	Management of Health Care Organizations	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
HADM 683	Executive Skills II	1
HADM 693	Internship in Health Administration	3
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO electives (chosen with permission of adviser)		6
INFO focus area courses (see options below)		12
Total Hours		78

Total graduate credit hours required (minimum) 78

Information systems focus areas

Students must declare a focus in two of the following areas and take the classes offered for each of those two areas for a total of 12 credit hours.

Course	Title	Hours
Business engineering		
INFO 611	Data Re-engineering	3
INFO 632	Business Process Engineering	3
Information assurance		
INFO 622	Internet Security Management	3
INFO 644	Principles of Computer and Information Systems Security	3
Information technology management		
INFO 641	Strategic Information Systems Planning	3
INFO 643	Information Technology Project Management	3
Knowledge engineering		
INFO 614	Data Mining	3
INFO 616	Data Warehousing	3

Sample M.H.A./M.S. in Information Systems plan of study

Year one		
Fall semester		**Hours**
HADM 602	Health System Organization, Financing and Performance	3
HADM 606	Health Care Managerial Accounting	3
HADM 609	Managerial Epidemiology	2
HADM 646	Health Care Organization and Leadership	3
HADM 681	Clinical Concepts and Relationships	2
HADM 682	Executive Skills I	1
Prerequisite HADM or INFO courses if needed		
	Term Hours:	14
Spring semester		
HADM 607	Financial Management in Health Organizations	3
HADM 610	Health Analytics and Decision Support	3
HADM 624 or ECON 624	Health Economics or Health Economics	3
HADM 647	Management of Health Care Organizations	3
Prerequisite HADM or INFO courses if needed		
	Term Hours:	12
Summer semester		
Prerequisite INFO courses if needed		
	Term Hours:	0
Year two		
Fall semester		
HADM 608	Seminar in Health Care Finance	3
HADM 612	Information Systems for Health Care Management	3
HADM 615	Health Care Politics and Policy	3
HADM 683	Executive Skills II	1
INFO course (elective or focus area course from above)		3
Prerequisite INFO courses, if needed		
	Term Hours:	13
Spring semester		
HADM 611	Health Care Law and Bioethics	3
HADM 614	Health Care Marketing	3
HADM 648	Strategic Management in Health Care Organizations	3
HADM 649	Human Resources Management in Health Care	3
	Term Hours:	12

Summer semester		
HADM 693	Internship in Health Administration	3
	Term Hours:	3
Year three		
Fall semester		
INFO 610	Analysis and Design of Database Systems	3
INFO 620	Data Communications	3
INFO 630	Systems Development	3
INFO focus area course (from above)		3
	Term Hours:	12
Spring semester		
INFO elective		3
INFO focus area courses (from above)		9
	Term Hours:	12
	Total Hours:	78

Graduate program director
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Program website: had.vcu.edu/prospective/mha (http://sahp.vcu.edu/departments/ha/mha/prospective-students)

Department of Management and Entrepreneurship

S. Douglas Pugh, Ph.D.
Associate professor and chair

business.vcu.edu/departments-and-centers/management (http://business.vcu.edu/departments-and-centers/management)

The Department of Management and Entrepreneurship offers a Bachelor of Science in Business with concentrations in human resource management, management/business administration, management/entrepreneurship and management/international management. The department also offers a human resource management minor and a certificate in international management studies, as well as a doctoral degree in business with a concentration in management.

Department of Marketing

Bruce Huhmann, Ph.D.
Professor and chair

business.vcu.edu/departments-and-centers/marketing (http://business.vcu.edu/departments-and-centers/marketing)

The Department of Marketing provides students with a comprehensive introduction to the many topics and concepts that make up today's marketing professions. Additionally students have the opportunity to participate in high quality learning experiences that broaden traditional ideas of the classroom in projects, exercises and internship experiences that involve a variety of business organizations as well as state and local government agencies.

Department of Supply Chain Management and Analytics

Jeffery Smith, Ph.D.
Associate professor and chair

business.vcu.edu/departments-and-centers/supply-chain-management-and-analytics (http://business.vcu.edu/departments-and-centers/supply-chain-management-and-analytics)

Faculty in the Department of Supply Chain Management and Analytics are passionate about providing impeccable academic instruction and research that advances knowledge related to production, product development and the information systems needed to direct these endeavors. The department's undergraduate and graduate programs prepare students to immediately take important positions related to supply chain management and business analytics. The department remains involved with the corporate community through a partnership with the Commonwealth Center for Advanced Logistics Systems.

Students interested in production, distribution, and the engineering and finances supporting large-scale operations will be prepared by VCU's programs in supply chain management and analytics to enter an exciting field with plentiful job opportunities. For additional information contact the department by emailing scma@vcu.edu.

- Decision Analytics, Master of (M.D.A.) (p. 477)
- Decision Analytics, Master of (M.D.A.) – professional track (p. 479)
- Decision Analytics, Master of (M.D.A.) with a concentration in health care management (p. 481)
- Decision Analytics, Master of (M.D.A.) with a concentration in health care management – professional track (p. 483)
- Supply Chain Management, Master of (M.S.C.M.) (p. 484)

Decision Analytics, Master of (M.D.A.)

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Decision Analytics provides students with knowledge of the statistical, mathematical and scientific skills and experience necessary to utilize advanced methods of data analysis for business decision-making.

Student learning outcomes

1. Analytic skills: Students will demonstrate the ability to develop appropriate hypotheses, test those hypotheses, draw logical conclusions and make reasonable decisions based on available information.
2. Quantitative skills: Students will demonstrate the ability to apply quantitative procedures and apply data-driven decision approaches to solving problems in contemporary organizations using business-oriented computational software.
3. Communication skills: Students will demonstrate the ability to communicate complex business problems by any appropriate

method, including graphical displays of data to express ideas with clarity.
4. Students will demonstrate the ability to discern an ethical dilemma in a business context and determine the appropriate course of action to communicate data and analyses ethically.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.D.A.	Fall	Jul 1	GMAT or GRE*
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

The decision analytics degree provides students with knowledge of quantitative skills and experience in analyzing problems and using data for decision-making in a business environment. Depending upon individual student interests and adviser approval, the required nucleus is supplemented with relevant elective courses from within the School of Business or from outside departments.

In addition to the VCU Graduate School graduation requirements (p. 31):

1. All students must have completed a course in calculus and database systems. Students must also be proficient at an intermediate level with a spreadsheet. These prerequisites can be met after admission to the program.
2. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following prerequisite courses and/or foundation course may be waived. A waiver may be awarded when a student demonstrates equivalent knowledge, such as completing the required undergraduate equivalent course to the satisfaction of the admission committee.

Prerequisites

Course	Title	Hours
INFO 364	Database Systems	3
SCMA 212	Differential Calculus and Optimization for Business	3
or MATH 200	Calculus with Analytic Geometry	

Curriculum requirements

Course	Title	Hours
Foundation course		
SCMA 524	Statistical Fundamentals for Business Management	3
Required core courses		
INFO 610	Analysis and Design of Database Systems	3

SCMA 632	Statistical Analysis and Modeling	3
SCMA 645	Management Science	3
SCMA 648	Analytics for Organizational Decision-making	3
SCMA 669	Developing and Implementing Forecasting Methods for Business	3
Approved electives		
Select 15 credits from:		15
ACCT 608	Managerial Accounting Concepts	
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 614	Mathematical Economics	
FIRE 629	Real Estate Investment Analysis	
FIRE 635	Investments and Security Analysis	
INFO 609	Data-centric Re-engineering Analysis/ Planning	
INFO 611	Data Re-engineering	
INFO 614	Data Mining	
INFO 616	Data Warehousing	
INFO 632	Business Process Engineering	
INFO 664	Information Systems for Business Intelligence	
MGMT 642	Business Policy and Strategy	
MKTG 673	Marketing Research	
MKTG 678	Marketing Analytics	
OPER 528	Stochastic Simulation	
OPER/STAT 636	Machine Learning Algorithms	
OPER 643	Decision and Risk Analysis	
OPER 647	Multiobjective Decision Analysis	
SCMA 602	Global Supply Chain Management	
SCMA 603	SAP ERP and Supply Chain Management	
SCMA 606	Supply Chain Innovation	
SCMA 643	Applied Multivariate Methods	
SCMA 675	Operations Management	
SCMA 677	Quality Management and Six Sigma	
SCMA 697	Guided Study in Supply Chain Management	
Total Hours		33

Total graduate credit hours required (minimum) 33 (30 if foundation course is waived)

Graduate program director
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Program website: business.vcu.edu/graduate/dsba.html (http://business.vcu.edu/graduate/dsba.html)

Decision Analytics, Master of (M.D.A.) – professional track

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The M.D.A. program provides in-depth knowledge of one business discipline and allows students to develop and build technical skills in their specific areas of interest. It is frequently recommended for students with undergraduate business degrees.

Student learning outcomes

1. **Database structures and query:** Students will have an understanding of basic database structures, be able to query databases and organize data for analysis.
2. **Quantitative skills:** Students will be able to identify appropriate data analysis approaches to address real-world problems. They will be able to perform the analysis using commercial software.
3. **Problem formulation:** Students will have the knowledge, skills and practice to taking nonquantitative and perhaps ill-formed problems and issues and determining ways objective analysis can bring organization and insight to them. They will be able to determine data requirements and query available databases.
4. **Analytics applications:** Students will experience various applications of analytics in real situations.
5. **Technical communications:** Students will be able to communicate analytical analysis and results effectively to nonquantitative audiences. This includes informal discussions, formal presentations and written reports.
6. **Teamwork:** Students will develop skills in organizing, interacting and analyzing real problems as members of a team.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for

continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students (http://business.vcu.edu/graduate-studies/current-graduate-students) are available on the school's website.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.D.A.	Fall	Apr 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants should have three years of work experience in an application area. Students without the required work experience may take six credit hours of graduate-level courses in an application area prior to acceptance into the program. Applicants are expected to have successfully completed an undergraduate or graduate course in statistics, and it is preferable that they have programming experience. Exceptions may be made at the discretion of the program director.

Degree requirements

The Master of Decision Analytics provides students with a breadth of analytical and quantitative skills with experience in analyzing and communicating solutions to problems arising in an organization.

Leading organizations gain competitive advantage through the use of analysis of relevant data to guide and drive strategic and tactical decisions. Increased volumes of data and emphasis on data-driven decision-making create new challenges for decision-makers and provide new employment opportunities for people with deep analytical skills. There is a significant and growing demand for individuals with the ability to work collaboratively within an organization to mine relevant raw data and refine data into a recommended action of value to the enterprise. The decision analytics degree equips students with the essential skills to be analytically functional in an organization.

Skills, abilities and knowledge necessary for success in analytics:

1. Work in a collaborative environment
2. Translate specific business questions into problems that can be insighted through data analysis
3. Acquire and organize appropriate data so it can be used for analysis
4. Know general principles and common tools and be able to apply them to analyze specific business problems
5. Develop and effectively communicate an actionable solution for specific business questions

The decision analytics degree focuses on the applications of digital and information technology, decision sciences and statistics to decision-making and problem-solving in organizations. The program will give students the theory, knowledge and skills to:

1. Formulate frequently nonquantitative and ill-formed business issues so they can be insighted through data analytics
2. Retrieve, cleanse and organize data from mega databases (big data)
3. Perform appropriate statistical analysis and interpret the results
4. Explain analytical results to nonquantitative management

The professional track is presented in a concentrated weekend schedule, making the program attractive to midcareer professionals who want to gain or increase their analytics skills without interrupting their careers.

In addition to the VCU Graduate School graduation requirements (p. 31) and credit hour requirements, students must complete up to four classes (zero to 12 credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waivers of foundation courses only occur when a student has completed the required undergraduate equivalent courses with a minimum grade of C.

Curriculum requirements

Course	Title	Hours
Courses		
DAPT 611	Analysis and Design of Database Systems	3
DAPT 612	Text Mining and Unstructured Data	2
DAPT 613	Tools for Business Intelligence	1
DAPT 614	Advanced SQL	1
DAPT 615	Emerging Technologies	1
DAPT 621	Statistics for the World of Big Data	3
DAPT 622	Statistics for the World of Big Data II	3
DAPT 631	Data Mining	2
DAPT 632	Forecasting Methods and Applications for Managerial Decision-making	2
DAPT 633	Introduction to Marketing and Customer Analytics	2
DAPT 641	Introduction to Simulation Methods	1
DAPT 642	Introduction to Risk Analysis	1
DAPT 643	Introduction to Optimization Models	1
DAPT 651	Personal, Interpersonal and Organizational Awareness	1

DAPT 652	Professional Presentations: Strategy, Delivery and Technology	1
DAPT 653	Written Communications: Strategy, Structure and Connection	1
DAPT 661	Issues and Analytics (one-credit course repeated for three credits total)	3
DAPT 670	Analytics Problem Formation	1
DAPT 681	Analytics Practicum I	1
DAPT 682	Analytics Practicum II	2
Total Hours		33

Total graduate credit hours required (minimum) 33

There are no electives, substitutions or exemptions.

Graduate program director
Rachel Kaeser
Program manager
Email: rekaeser@vcu.edu (androvichcm@vcu.edu)
Phone: (804) 828-7036

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/analytics.html (http://business.vcu.edu/graduate/analytics.html)

Decision Analytics, Master of (M.D.A.) with a concentration in health care management

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The Master of Decision Analytics provides students with knowledge of the statistical, mathematical and scientific skills and experience necessary to utilize advanced methods of data analysis for business decision-making.

Student learning outcomes

1. After examining a situation/problem, students will be able to develop appropriate hypotheses along with a method for testing them and be able to draw logical conclusions and make reasonable decisions based on available information.
2. Students will be able to apply quantitative procedures to obtain solutions for real-world problems.
3. Students will be able to appropriately address the target audience, use proper organization, create clear graphical displays and express ideas with clarity and grammatical correctness.
4. Students will be able to show a clear understanding of the ethical nature of the issue and recommend appropriate action.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.D.A.	Fall	Jul 1	GMAT or GRE
	Spring	Nov 1	
	Summer	Mar 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the master's program in business must submit an up-to-date resume.

Degree requirements

The decision analytics degree provides students with knowledge of quantitative skills and experience in analyzing problems and using data for decision-making in a business environment. Depending upon individual student interests and adviser approval, the required nucleus is supplemented with relevant elective courses from within the School of Business or from outside departments.

In addition to the VCU Graduate School graduation requirements (p. 31):

1. All students must have completed a course in calculus prior to attempting graduate business courses. This prerequisite can be met after admission to the program.
2. Students must complete up to four classes (zero to 12 credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waiver of a foundation course may be awarded when a student demonstrates equivalent knowledge, such as completing the required undergraduate equivalent course with minimum grade of C.

The concentration in health care administration requires an additional nine credit hours beyond the minimum 30-credit hours required for the degree.

Curriculum requirements

Course	Title	Hours
Prerequisite		
Calculus		
SCMA 212	Differential Calculus and Optimization for Business	3
or SCMA 500	Quantitative Foundation for Decision-making	
Foundation courses		
SCMA 524	Statistical Fundamentals for Business Management	3
Select three of the following:		9
ACCT 507	Fundamentals of Accounting	
ECON 500	Concepts in Economics	
FIRE 520	Financial Concepts of Management	
MGMT 540	Management Theory and Practice	
MKTG 570	Concepts and Issues in Marketing	
SCMA 530	Fundamentals of the Legal Environment of Business	
Required core courses		
INFO 614	Data Mining	3
INFO 664	Information Systems for Business Intelligence	3
SCMA 632	Statistical Analysis and Modeling	3
SCMA 645	Management Science	3
SCMA 648	Analytics for Organizational Decision-making	3
Approved electives		
Select 15 credits from:		15
ACCT 608	Managerial Accounting Concepts	
ECON 501	Introduction to Econometrics	
ECON 610	Managerial Economics	
ECON 612	Econometrics	
FIRE 629	Real Estate Investment Analysis	
FIRE 635	Investments and Security Analysis	
INFO 610	Analysis and Design of Database Systems	
INFO 611	Data Re-engineering	
INFO 616	Data Warehousing	
MGMT 642	Business Policy and Strategy	
MGMT 697	Guided Study in Management	
MKTG 673	Marketing Research	
OPER 528	Stochastic Simulation	
OPER/STAT 636	Machine Learning Algorithms	
OPER 643	Decision and Risk Analysis	
SCMA 643	Applied Multivariate Methods	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
SCMA 675	Operations Management	
Health care management concentration required courses		
FMBA 614	Health Care Management I: National Perspective	3
FMBA 615	Health Care Management II: Employer's Perspective	3
FMBA 616	Health Care Management III: Industry Perspective	3
Total Hours		54

Total graduate credit hours required (minimum) 54 (39 if prerequisite and all foundation courses are waived)

Graduate program director
Austen Gouldman
Director, graduate programs
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Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/dsba.html (http://business.vcu.edu/graduate/dsba.html)

Decision Analytics, Master of (M.D.A.) with a concentration in health care management – professional track

Program accreditation
Association to Advance Collegiate Schools of Business (http://www.aacsb.edu)

Program goal

The M.D.A. program provides in-depth knowledge of one business discipline and allows students to develop and build technical skills in their specific areas of interest. It is frequently recommended for students with undergraduate business degrees.

Student learning outcomes

1. **Database structures and query:** Students will have an understanding of basic database structures, be able to query databases and organize data for analysis.
2. **Quantitative skills:** Students will be able to identify appropriate data analysis approaches to address real-world problems. They will be able to perform the analysis using commercial software.
3. **Problem formulation:** Students will have the knowledge, skills and practice to taking nonquantitative and perhaps ill-formed problems and issues and determining ways objective analysis can bring organization and insight to them. They will be able to determine data requirements and query available databases.
4. **Analytics applications:** Students will experience various applications of analytics in real situations.
5. **Technical communications:** Students will be able to communicate analytical analysis and results effectively to nonquantitative audiences. This includes informal discussions, formal presentations and written reports.
6. **Teamwork:** Students will develop skills in organizing, interacting and analyzing real problems as members of a team.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Business policies and procedures for graduate master's degree students (http://business.vcu.edu/graduate-studies/current-graduate-students) are available on the school's website.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.D.A.	Fall	Apr 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants should have three years of work experience in an application area. Students without the required work experience may take six credit hours of graduate-level courses in an application area prior to acceptance into the program. Applicants are expected to have successfully completed an undergraduate or graduate course in statistics, and it is preferable that they have programming experience. Exceptions may be made at the discretion of the program director.

Degree requirements

The Master of Decision Analytics provides students with a breadth of analytical and quantitative skills with experience in analyzing and communicating solutions to problems arising in an organization.

Leading organizations gain competitive advantage through the use of analysis of relevant data to guide and drive strategic and tactical decisions. Increased volumes of data and emphasis on data-driven decision-making create new challenges for decision-makers and provide new employment opportunities for people with deep analytical skills.

There is a significant and growing demand for individuals with the ability to work collaboratively within an organization to mine relevant raw data and refine data into a recommended action of value to the enterprise. The decision analytics degree equips students with the essential skills to be analytically functional in an organization.

Skills, abilities and knowledge necessary for success in analytics:

1. Work in a collaborative environment
2. Translate specific business questions into problems that can be insighted through data analysis
3. Acquire and organize appropriate data so it can be used for analysis
4. Know general principles and common tools and be able to apply them to analyze specific business problems
5. Develop and effectively communicate an actionable solution for specific business questions

The decision analytics degree focuses on the applications of digital and information technology, decision sciences and statistics to decision-making and problem-solving in organizations. The program will give students the theory, knowledge and skills to:

1. Formulate frequently nonquantitative and ill-formed business issues so they can be insighted through data analytics
2. Retrieve, cleanse and organize data from mega databases (big data)
3. Perform appropriate statistical analysis and interpret the results
4. Explain analytical results to nonquantitative management

The professional track is presented in a concentrated weekend schedule, making the program attractive to midcareer professionals who want to gain or increase their analytics skills without interrupting their careers.

In addition to the VCU Graduate School graduation requirements (p. 31) and credit hour requirements, students must complete up to four classes (zero to 12 credit hours) of foundation course work. At the time of application, all undergraduate and graduate transcripts will be reviewed to determine if the following courses may be waived. Waivers of foundation courses only occur when a student has completed the required undergraduate equivalent courses with a minimum grade of C.

The concentration in health care management will require an additional nine credit hours beyond the minimum 33-credit hours required for the degree.

Curriculum requirements

Course	Title	Hours
Courses		
DAPT 611	Analysis and Design of Database Systems	3
DAPT 612	Text Mining and Unstructured Data	2
DAPT 613	Tools for Business Intelligence	1
DAPT 614	Advanced SQL	1
DAPT 615	Emerging Technologies	1
DAPT 621	Statistics for the World of Big Data	3
DAPT 622	Statistics for the World of Big Data II	3
DAPT 631	Data Mining	2
DAPT 632	Forecasting Methods and Applications for Managerial Decision-making	2
DAPT 633	Introduction to Marketing and Customer Analytics	2
DAPT 641	Introduction to Simulation Methods	1
DAPT 642	Introduction to Risk Analysis	1
DAPT 643	Introduction to Optimization Models	1
DAPT 651	Personal, Interpersonal and Organizational Awareness	1
DAPT 652	Professional Presentations: Strategy, Delivery and Technology	1
DAPT 653	Written Communications: Strategy, Structure and Connection	1
DAPT 661	Issues and Analytics (one-credit course repeated for three credits total)	3
DAPT 670	Analytics Problem Formation	1
DAPT 681	Analytics Practicum I	1
DAPT 682	Analytics Practicum II	2
Required concentration courses		
FMBA 614	Health Care Management I: National Perspective	3
FMBA 615	Health Care Management II: Employer's Perspective	3
FMBA 616	Health Care Management III: Industry Perspective	3
Total Hours		42

Total graduate credit hours required (minimum) 42

There are no electives, substitutions or exemptions.

Graduate program director
Rachel Kaeser
Program manager
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Phone: (804) 828-7036

Additional contact
Graduate Studies in Business
Email: gsib@vcu.edu
Phone: (804) 828-4622

Program website: business.vcu.edu/graduate/analytics.html (http://business.vcu.edu/graduate/analytics.html)

Supply Chain Management, Master of (M.S.C.M.)

Program accreditation
Association to Advance Collegiate Schools of Business

Program goal

The Master of Supply Chain Management program will educate students on the theory, skills and practices necessary to manage the daily challenges in managing global supply chains. Students will be introduced to supply management and logistics systems, international logistics, transportation management, enterprise resource planning and innovation processes. In addition, students will learn how to identify problems, gather information, analyze data, interpret solutions, establish contingencies and effectively present results.

Although developed in collaboration with the U.S. Army, the intent of the program is to provide an opportunity for both military officers and civilians to earn a master's degree in supply chain management.

Student learning outcomes

Students in the Master of Supply Chain Management program will be able to:

1. Manage supply chains: Students will demonstrate the knowledge required to successfully manage complex global supply chains.
2. Manage data and uncertainty: Students will demonstrate the ability to manage huge stores of data within a global supply chain and manage the risk associated with proprietary data.
3. Identify innovative solutions: Students will demonstrate the ability to apply and communicate innovative solutions to supply chain challenges and opportunities.
4. Communication skills: Students will demonstrate the ability to communicate the results of complex data analyses to management of an organization.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Business policies and procedures for graduate master's degree students are available on the school's website at business.vcu.edu/graduate-studies/current-graduate-students (http://business.vcu.edu/graduate-studies/current-graduate-students).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.C.M.	Fall	Jul 1	GRE or GMAT*
	Spring	Nov 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must submit an up-to-date resume.

*Test requirements may be waived for candidates with an undergraduate or graduate degree from an accredited U.S. institution with a minimum GPA of 3.25. Waiver request information can be found on the Graduate Studies in Business webpage (https://business.vcu.edu/graduate-studies/how-to-apply).

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 30 credit hours. These credit hours consist of six core courses (18 credit hours), two analytics courses (six credit hours) and two elective courses (six credit hours).

Curriculum requirements

Course	Title	Hours
Foundation course		
SCMA 524	Statistical Fundamentals for Business Management [1]	
Core courses		
SCMA 602	Global Supply Chain Management	3
SCMA 603	SAP ERP and Supply Chain Management	3
SCMA 606	Supply Chain Innovation	3
SCMA 645	Management Science	3
SCMA 675	Operations Management	3
SCMA 697	Guided Study in Supply Chain Management	3
Analytics courses		

Select two from the following:		6
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
OPER/STAT 649	Statistical Quality Control	
SCMA 632	Statistical Analysis and Modeling	
SCMA 648	Analytics for Organizational Decision-making	
SCMA 669	Developing and Implementing Forecasting Methods for Business	
SCMA 677	Quality Management and Six Sigma	
Electives		
Select two approved electives which may include the following (and courses not used toward analytics requirement above):		6
ACCT 608	Managerial Accounting Concepts	
INFO 620	Data Communications	
INFO 632	Business Process Engineering	
INFO 661	Information Systems for Managers	
INFO 664	Information Systems for Business Intelligence	
MGMT 654	Negotiations	
MGMT 655	Entrepreneurship	
MGMT 656	Best Practices in Leadership	
MKTG 671	Marketing Management	
MKTG 673	Marketing Research	
MKTG 674	Service Quality Management	
MKTG 675	Digital Marketing	
MKTG 678	Marketing Analytics	
SCMA 643	Applied Multivariate Methods	
Total Hours		30

[1]

Course may be waived for demonstrated equivalence.

Total graduate credit hours required (minimum) 30 (33 if foundation course is required)

Graduate program director
Austen Gouldman
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Phone: (804) 828-4622

Additional contact
Graduate Studies in Business
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Phone: (804) 828-4622

Program website business.vcu.edu/graduate/mastersupplychain.html (http://business.vcu.edu/graduate/mastersupplychain.html)

SCHOOL OF DENTISTRY

The School of Dentistry was created in 1893 when the University College of Medicine opened with a dental department as one of its original divisions. The Medical College of Virginia inaugurated a dental education program in 1897, and in 1913 the two schools were merged to form the MCV School of Dentistry.

In 1968, by an act of the Virginia General Assembly, MCV was merged with Richmond Professional Institute to form Virginia Commonwealth University. The School of Dentistry is located on VCU's MCV Campus.

The facilities of the School of Dentistry are housed in the Wood Memorial, Lyons and Perkinson buildings and contain clinical facilities, research facilities, classrooms, student laboratories, departmental offices and a computer-learning laboratory.

The school provides opportunities for selected, qualified individuals to study dentistry under the most favorable conditions and in accordance with the standards established by the Commission on Dental Accreditation of the American Dental Association.

The degree of Doctor of Dental Surgery (D.D.S.) is awarded to graduates of the school's professional program and the Bachelor of Science degree to graduates of the Dental Hygiene Program within the Department of Oral Health Promotion and Community Outreach.

Graduates of the advanced dental education programs in endodontics, orthodontics, pediatric dentistry and periodontics are awarded the Master of Science in Dentistry degree.

Administration

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B. Ellen Byrne, D.D.S., Ph.D.
Senior associate dean

Laurie C. Carter, D.D.S., Ph.D.
Director, Advanced Dental Education Programs

Riki Gottlieb, D.M.D.
Assistant dean, Admissions

Michael Healy, D.D.S.
Senior associate dean, Student Services

Kim T. Isringhausen, R.D.H.
Assistant dean, Community and Collaborative Partnerships

Rebecca Pousson
Executive associate dean

Harvey A. Schenkein, D.D.S., Ph.D.
Assistant dean, Research

Accreditation

Dental hygiene (bachelor's degree)

Commission on Dental Accreditation

Dentistry (D.D.S.)

Commission on Dental Accreditation

Advanced Dental Education Programs*

Commission on Dental Accreditation

*(includes endodontics, oral and maxillofacial surgery, orthodontics, pediatric dentistry, periodontics and Advanced Education in General Dentistry)

Mission

The mission of the VCU School of Dentistry:

- **Education** of highly qualified dental professionals
- **Research** that advances the understanding of oral health, disease and effective treatment
- **Service** to the community
- Improved oral and general **health** of our patients and the general population

Philips Institute for Oral Health Research

Iain M. Morgan, Ph.D.
Director

The mission of the Philips Institute for Oral Health Research is to serve the university and the commonwealth of Virginia as a center of educational and research excellence focused on infectious, neoplastic and genetic diseases of the oral cavity, head and neck.

Dentistry, Master of Science in (M.S.D.) with a concentration in endodontics

Program accreditation
Commission of Dental Accreditation of the American Dental Association

Program goal

The advanced dental specialty education program in endodontics offers the resident a comprehensive 24-month course of study in clinical and didactic endodontics. The program is designed to educate qualified individuals to pursue careers as practicing clinical dental specialists in endodontics. The program meets the educational requirements for limitation of practice to the specialty of endodontics and prepares the student for examination by the American Board of Endodontics.

Students completing the program earn a specialty Certificate in Endodontics and a Master of Science in Dentistry degree. The program conforms to the Standards for Advanced Specialty Education in Endodontics and carries a full approval status from the Commission on Dental Accreditation of the American Dental Association.

Student learning outcomes

Graduates of this program will:

1. Formulate and conduct a relevant research project as evidenced in the completion of a master's thesis in a publishable format for a refereed journal
2. Be equipped to practice evidence-based endodontics
3. Have demonstrated the ability to communicate with patients, colleagues in general dentistry, dental specialties, medicine and other health care practitioners in the provision of ethical and informed patient care
4. Be proficient in:
   a. Diagnosis, treatment planning and prognosis of pulpal and periradicular disease
   b. Provision of nonsurgical endodontics, retreatment and surgical endodontics
   c. Outcome assessment
   d. Diagnostic imaging technologies
   e. Management of medically compromised patients
   f. Emergency management of endodontic conditions
   g. Management of orofacial pain and dental anxiety
   h. Use of magnification technologies
   i. Use of emerging techniques of endodontic treatment
   j. Management of traumatic dental injuries
5. Be eligible to sit for the Diplomate Boards of the American Board of Endodontists

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For a current copy of the program handbook, contact the VCU School of Dentistry's Department of Endodontics.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.D.	Fall (Jul 1 start date)	Aug 15	National Dental Boards, part 1 and 2

Special requirements

- Applicants from countries where English is not the primary and official language must complete the TOEFL with a minimum score of 100.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Graduation from an accredited university or its equivalent, with a Doctor of Dental Surgery or Doctor of Medicine in Dentistry or the international equivalent
2. For international students, an external credential evaluation of all international transcripts to complete the application (WES, ECE, and AACRAO are some of the recommended NACES-approved providers.)
3. One "dean's letter" from the academic institution from which the individual received the dental degree that gives class rank, GPA and overall academic recommendation
4. Two letters of recommendation from individuals who are in a position to judge the applicant's ability to engage in graduate study and pursue advanced dental training
5. A written letter of professional intent or biographical statement that reflects the candidate's desire to pursue the specialty and the intent upon receipt of the degree and certificate
6. A resume or curriculum vitae

7. An administrative application fee made payable to the Department of Endodontics, School of Dentistry (See website for details. This fee is in addition to the application fee that has to be paid with the submission of the graduate application. One year of an AEGD, GPR or the private practice equivalent is preferred but not required.)

Admission to the advanced dental specialty program in endodontics is through American Dental Education Association Postdoctoral Application Support Service. PASS historically opens to receive applications mid-May of the year prior to the year for which the candidate wishes to enroll and is open until Aug. 15. Please refer to the VCU School of Dentistry website, Department of Endodontics postgraduate information or ADEA PASS for specific yearly dates of the application period.

Candidates are required to interview in person. Invitations to interview followed by an invitation to accept a position in the residency are extended by the program director in the fall at the close of the application period. For example, the candidate will submit an application through ADEA PASS during the application period (May through August). An invitation will be extended to interview with the advanced dental specialty program in endodontics admission committee in August or September. The candidate will be informed of selection or nonselection by Nov. 15. The resident will start the clinical program the following June and the academic program the following September.

Admission to the Master of Science in Dentistry degree program is made after the candidate has accepted a residency position in the advanced dental specialty program in endodontics.

Degree requirements

All course work must be completed within the 24-month timeframe for the program. Any extension of the 24-months is at the discretion of the program director. Extensions are approved only in extenuating circumstances.

In addition to general VCU Graduate School graduation requirements (p. 31), a cumulative GPA of 3.0 must be maintained. Residents must receive a minimum grade of B for all required courses. A student with a grade of C in a required course may be required to repeat the course. A second grade of C in a required course may result in dismissal from the program. At the discretion of the program director, a resident retaking a required course may still be eligible to take the comprehensive written and oral examinations and to start the thesis research process prior to successful completion of the repeat of the course.

In the last semester of the second year the resident will take a written and an oral comprehensive examination designed to evaluate the resident's ability to integrate the didactic and clinical course material, demonstrate critical-thinking skills and demonstrate command of evidence-based endodontics. Both the written and oral examinations must be successfully completed to receive the specialty Certificate in Endodontics.

The Certificate of Endodontics, conferred by the School of Dentistry, is only conferred upon completion and awarding of the Master of Science in Dentistry.

The residents must formulate, complete and defend a research project. The resident will prepare a manuscript in a thesis format or in the publishable format of a refereed journal. The project must be completed, defended and presented in a research forum in order for the resident to qualify for receipt of the Master of Science in Dentistry.

Curriculum requirements

Course	Title	Hours
DENS 550	Update in Practice Administration	1
DENS 580	Biostatistics and Research Design in Dentistry (two credits taken twice)	4
DENS 660	Interdisciplinary Care Conference (0.5 credits earned twice) [1]	1
DENS 699	Thesis Guidance (two credits taken four times)	8
DENS 700	Basic Sciences and Graduate Dentistry	3
ENDO 522	Introduction: Specialty of Endodontics	2
ENDO 530	Advanced Oral Pathology (one credit taken twice)	2
ENDO 532	Management of Medical Emergencies in the Dental Office (one credit taken twice)	2
ENDO 560	Endodontic Therapy Lectures	3.5
ENDO 650	Endodontic Topic Literature Review (3.5 credits taken four times)	14
ENDO 652	Endodontic Clinical Seminars (1.5 credits taken four times)	6
ENDO 654	Endodontic Management of the Medically Compromised Patient (one credit taken twice)	2
ENDO 656	Endodontic Current Literature Review (one credit taken four times)	4
ENDO 680	Clinical Endodontics (five credits taken four times)	20
Total Hours		72.5

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two .5 credit classes.

Total graduate credit hours required (minimum) 72.5

Plan of study

The following illustrates how the course requirements are met during the 24 months of the program. No additional class work or course work is required other than the required courses listed below.

Year one		
Fall semester		**Hours**
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 660	Interdisciplinary Care Conference (no credits earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ENDO 522	Introduction: Specialty of Endodontics	2
ENDO 532	Management of Medical Emergencies in the Dental Office	1
ENDO 560	Endodontic Therapy Lectures	3.5
ENDO 650	Endodontic Topic Literature Review	3.5

ENDO 652	Endodontic Clinical Seminars	1.5
ENDO 656	Endodontic Current Literature Review	1
ENDO 680	Clinical Endodontics	5
	Term Hours:	21.5
Spring semester		
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
DENS 700	Basic Sciences and Graduate Dentistry	3
ENDO 530	Advanced Oral Pathology	1
ENDO 650	Endodontic Topic Literature Review	3.5
ENDO 652	Endodontic Clinical Seminars	1.5
ENDO 654	Endodontic Management of the Medically Compromised Patient	1
ENDO 656	Endodontic Current Literature Review	1
ENDO 680	Clinical Endodontics	5
	Term Hours:	20.5
Year two		
Fall semester		
DENS 550	Update in Practice Administration	1
DENS 660	Interdisciplinary Care Conference (no credits earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ENDO 532	Management of Medical Emergencies in the Dental Office	1
ENDO 650	Endodontic Topic Literature Review	3.5
ENDO 652	Endodontic Clinical Seminars	1.5
ENDO 656	Endodontic Current Literature Review	1
ENDO 680	Clinical Endodontics	5
	Term Hours:	15
Spring semester		
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
ENDO 530	Advanced Oral Pathology	1
ENDO 650	Endodontic Topic Literature Review	3.5
ENDO 652	Endodontic Clinical Seminars	1.5
ENDO 654	Endodontic Management of the Medically Compromised Patient	1
ENDO 656	Endodontic Current Literature Review	1
ENDO 680	Clinical Endodontics	5
	Term Hours:	15.5
	Total Hours:	72.5

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two .5 credit classes.

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Program website: endodontics.vcu.edu/postgrad (http://www.endodontics.vcu.edu/postgrad)

Dentistry, Master of Science in (M.S.D.) with a concentration in orthodontics

Program accreditation
Commission on Dental Accreditation of the American Dental Association

Program goal

The Department of Orthodontics offers a 24-month advanced education Master of Science in Dentistry program. The program teaches the latest in clinical care in an environment modeled after private orthodontic practice. The curriculum is composed of seminars and small-group instruction with emphasis on critical thinking and problem-solving. Contemporary concepts of orthodontic treatment are reviewed for substantive and scientific content. Also included are regularly scheduled orthognathic surgery conferences and seminars with other dental and medical specialists.

The postgraduate program is designed to develop skilled practitioners who are prepared to grow with the future and manage busy orthodontic practices. Our goal is not only to familiarize future orthodontists with contemporary techniques but also to teach them how to interpret cutting-edge scientific information and use it to approach clinical challenges logically and practically.

The program's clinical experience consists of a wide variety of orthodontic patients, including complex cases requiring orthognathic surgery and patients with facial clefts and other craniofacial abnormalities. An original research experience is an integral part of our program with each project intended to produce results suitable for publication in a nationally circulated orthodontic journal. The successful completion of a research project is required. All senior residents present their research at the Virginia Association of Orthodontists' meeting. The program makes students educationally qualified to take the written portion of the American Board of Orthodontics (http://www.americanboardortho.com) examination in the senior year. Residents are required to pass the written portion of the examination prior to graduation and are encouraged to continue and complete the board certification process. This exam is given prior to the American Association of Orthodontists' meeting.

Students completing the program earn a specialty Certificate in Orthodontics and Master of Science in Dentistry degree. Students must complete the requirements for the master's degree prior to being awarded the specialty certificate.

The program is accredited by the Commission on Dental Accreditation of the American Dental Association.

Student learning outcomes

Graduates of this program will:

1. Formulate and conduct a relevant research project as evidenced in the completion of a master's thesis in a publishable format for a refereed journal
2. Be equipped to practice evidence-based orthodontics
3. Have demonstrated the ability to communicate with patients, colleagues in general dentistry, dental specialties, medicine and other health care practitioners in the provision of ethical and informed patient care
4. Be proficient in:
   a. Diagnosis, treatment planning, treatment, retention and prognosis of dental malocclusions and
   b. dento-facial disharmony
   c. Outcome assessment
   d. Diagnostic imaging technologies
   e. Management of patients with craniofacial deformities
   f. Management of combined orthodontic and surgical cases
   g. Use of various fixed and removable appliances, aligner technology
   h. Use of temporary anchorage devices and soft tissue laser
   i. Use of digital technology for records taking and treatments with aligners
5. Be eligible to sit for the Diplomate Boards of the American Board of Orthodontists

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.D.	Fall (Jul 1 start date)	Sep 2	NBDE, GRE, TOEFL or IELTS if international

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Agreement to participate in the Postdoctoral Dental Matching Program
2. Agreement to participate in the American Dental Education Association Postdoctoral Application Support Service
3. Graduation or anticipated graduation from dental school
4. Eligibility to obtain a Virginia temporary resident's license from the Virginia Board of Dentistry
5. Completion of National Boards Part I and anticipated completion of Part II
6. Completion of GRE
7. Completion of TOEFL or IELTS (for students whose native language is not English)
8. Application to the orthodontic graduate program through the ADEA PASS program. The PASS application should include the following items:
   a. Online application form
   b. Essay/personal statement: Please tell us about your personal history that led you to apply for an educational program in orthodontics. Include your plans for the future and any factors you believe are important for us to know in reviewing your application. Please limit your comments to one page.
   c. Curriculum vitae/resume: Include a curriculum vitae/resume to give us more information about yourself. Include your education and work experiences, awards, honors, research experiences, and personal interests.
   d. Undergraduate college transcripts: Include official transcripts from all colleges or universities you have attended before dental school.
   e. Dental school transcripts

f. Institution Evaluation Form (completed by the dean of your dental school)
g. Personal potential index report (evaluation of different criteria by three to five evaluators compiled into a single report)
h. Professional evaluations: two letters of recommendation from individuals who can personally attest to your professional and personal qualities (the program director's letter can count as one). A letter from the chair of orthodontics is not required, but may be included if the chair has personal knowledge of your skills. **Note: Professional evaluations are listed as optional for PASS; however, they must be submitted for VCU's program.**

9. The following supplementary items are to be submitted directly to the VCU Department of Orthodontics:
   a. Application cover page
   b. Application fee of $50 (U.S. dollars drawn on a U.S. bank) made payable to VCU (Application fee is nonrefundable.)
   c. Official transcripts from all colleges or universities you have attended after dental school, if any (If you have attended a program without a transcript, such as a residency, we will need a letter from your program director documenting the experience.)
   d. Additional letters of recommendation may be submitted if you feel they would be beneficial to your application (optional).
   e. National Board scores: Have an original score report sent directly to the Department of Orthodontics from the National Board office in addition to enclosing a copy in your supplementary materials package/envelope. If you have taken other exams (or if you wish to add to your file), you may send any item of this type for our consideration. The National Board scores, Part I, are required (even if you are a graduate of a foreign school) no exceptions.
   f. GRE scores: Have an original score report sent directly to the Department of Orthodontics from the Educational Testing Service office in addition to enclosing a copy in your supplementary materials package/envelope. The GRE scores are required (even if you are a graduate of a foreign school) no exceptions.
   g. TOEFL or IELTS scores are required for students whose native language is not English. These scores are not required if you went to dental school or graduate school in an English-speaking environment (U.S.A., Canada, Australia or Great Britain, etc.). Foreign dental school graduates: Graduation from our orthodontic program qualifies you to apply for a dental license in the commonwealth of Virginia; however, other regulations apply. For example, after graduation from our program, you will be required to take and pass a regional testing agency dental examination.

Degree requirements

1. The 24-month certificate program in orthodontics begins July 1 with two weeks of classes to familiarize students with concepts of growth and development, diagnosis and treatment planning, and basic biomechanical principles. First-year residents see new patients in the clinic in mid-July. In August, first-year residents begin a full clinic schedule that includes a morning and afternoon clinic session on most days.
2. Didactic course work in the department consists primarily of small-group seminar sessions for an average of two hours each day.
3. Clinical work simulates a private-practice environment. Each team consists of one junior and one senior orthodontic resident and a dental assistant whose time is dedicated to that team. The orthodontic clinic has its own business manager, practice manager and receptionist. Patient records are computerized, and billing, scheduling and record storage are accomplished using a commercial orthodontic office management system. The objective is to maximize clinical efficiency so residents fully develop the thought processes necessary to master orthodontic principles and treatment techniques. Graduates are prepared to enter into a successful and busy orthodontic practice.

Curriculum requirements

Course	Title	Hours
DENS 550	Update in Practice Administration	1
DENS 580	Biostatistics and Research Design in Dentistry (two credits taken twice)	4
DENS 630	Orthodontic-Periodontic-AEGD Conference (0.5 credits taken four times) [1]	2
DENS 660	Interdisciplinary Care Conference (0.5 credits earned twice) [1]	1
DENS 699	Thesis Guidance (two credits taken four times)	8
DENS 700	Basic Sciences and Graduate Dentistry	3
ORTH 532	Biomechanics: Theoretical Basis for Tooth Movement	1
ORTH 650	Literature Review (two credits taken four times)	8
ORTH 652	Growth and Development (two credits taken four times)	8
ORTH 654	Orthodontic Diagnosis and Treatment Planning (two credits taken four times)	8
ORTH 656	Current Literature (two credits taken four times)	8
ORTH 658	Analysis of Orthodontic Treatment (1.5 credits taken four times)	6
ORTH 660	Orthognathic Conference (one credit taken four times)	4
ORTH 662	Craniofacial Anomalies (one credit taken four times)	4
ORTH 680	Orthodontic Clinic (6.5 credits taken four times)	26
Total Hours		92

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two .5 credit classes.

Total graduate credit hours required (minimum) 92

Plan of study

Year one		
Fall semester		**Hours**
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 630	Orthodontic-Periodontic-AEGD Conference [1]	0.5

DENS 660	Interdisciplinary Care Conference (no credits earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ORTH 532	Biomechanics: Theoretical Basis for Tooth Movement	1
ORTH 650	Literature Review	2
ORTH 652	Growth and Development	2
ORTH 654	Orthodontic Diagnosis and Treatment Planning	2
ORTH 656	Current Literature	2
ORTH 658	Analysis of Orthodontic Treatment	1.5
ORTH 660	Orthognathic Conference	1
ORTH 662	Craniofacial Anomalies	1
ORTH 680	Orthodontic Clinic	6.5
	Term Hours:	23.5

Spring semester

DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 630	Orthodontic-Periodontic-AEGD Conference [1]	0.5
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
DENS 700	Basic Sciences and Graduate Dentistry	3
ORTH 650	Literature Review	2
ORTH 652	Growth and Development	2
ORTH 654	Orthodontic Diagnosis and Treatment Planning	2
ORTH 656	Current Literature	2
ORTH 658	Analysis of Orthodontic Treatment	1.5
ORTH 660	Orthognathic Conference	1
ORTH 662	Craniofacial Anomalies	1
ORTH 680	Orthodontic Clinic	6.5
	Term Hours:	26

Year two

Fall semester

DENS 550	Update in Practice Administration	1
DENS 630	Orthodontic-Periodontic-AEGD Conference [1]	0.5
DENS 660	Interdisciplinary Care Conference (no credits earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ORTH 650	Literature Review	2
ORTH 652	Growth and Development	2
ORTH 654	Orthodontic Diagnosis and Treatment Planning	2
ORTH 656	Current Literature	2
ORTH 658	Analysis of Orthodontic Treatment	1.5
ORTH 660	Orthognathic Conference	1
ORTH 662	Craniofacial Anomalies	1
ORTH 680	Orthodontic Clinic	6.5
	Term Hours:	21.5

Spring semester

DENS 630	Orthodontic-Periodontic-AEGD Conference [1]	0.5
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
ORTH 650	Literature Review	2
ORTH 652	Growth and Development	2
ORTH 654	Orthodontic Diagnosis and Treatment Planning	2
ORTH 656	Current Literature	2
ORTH 658	Analysis of Orthodontic Treatment	1.5
ORTH 660	Orthognathic Conference	1
ORTH 662	Craniofacial Anomalies	1
ORTH 680	Orthodontic Clinic	6.5
	Term Hours:	21
	Total Hours:	92

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two .5 credit classes.

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Program website: orthodontics.vcu.edu/postgrad

Dentistry, Master of Science in (M.S.D.) with a concentration in pediatric dentistry

Program accreditation
Commission on Dental Accreditation of the American Dental Association

Program goals and objectives

The didactic requirements of the Master of Science in Dentistry are combined with the goals of the M.S.D. program to provide the student with a strong clinical background that is supported by a strong background in research methodology.

Program goals

1. To provide an academic environment for inquiry in which expertise and knowledge in basic sciences and clinical pediatric dentistry can be achieved
2. To provide a sound background in medicine as it applies to the pediatric/adolescent patient and to patients with special health care needs
3. To provide a sound background in oral pathology
4. To be able to interpret, critique and apply literature associated with the field of pediatric dentistry
5. To develop sound diagnostic, clinical, nonsurgical and surgical skills in the clinic and in the operating room

6. To provide didactic instruction and clinical training in the area of nonpharmacologic and pharmacologic behavior management
7. To provide instruction and training in growth and development to include clinical interceptive orthodontic care
8. To provide methods of pain and anxiety control, including nitrous oxide and oral conscious sedation
9. To provide an environment for the interpretation and implementation of research
10. Enable successful completion of the American Board of Pediatric Dentistry exam
11. To develop sound lifelong didactic and clinical learning skills
12. To provide specialists in pediatric dentistry for community health care, professional service and dental education

Program objectives

1. To be exposed to the basic sciences and be able to apply concepts to clinical pediatric dentistry
2. To be able to critically critique and interpret the old and new literature
3. To have an understanding of oral pathology and medicine as it applies to management of the pediatric/adolescent patient and patients with special health care needs
4. To have residents become exposed to and proficient in multiple nonsurgical and surgical treatment modalities to include treatment of patients under general anesthesia
5. To become competent in diagnosis and treatment planning
6. To obtain competency and certification in moderate conscious sedation
7. To complete research, M.S.D. and prepare a paper for presentation and publication
8. To prepare the student to successfully complete Part I and II of the ABPD examination
9. To develop communication and presentation skills and lifelong learners

Student learning outcomes

Graduates of this program will be competent in:

Knowledge – concepts, facts and information

1. Knowledge and skills in the areas of pediatric medicine and oral medicine, as well as the delivery of dental care and oral surgery for compromised children and adolescents
2. In-depth knowledge and skills in the use of pharmacologic and nonpharmacologic behavior management techniques
3. Knowledge of hospital protocol, policies, rules, regulations and the ability to treat pediatric dental patients in the hospital environment
4. Ability to evaluate the dental literature and its research findings to the benefit of patients and to engage in scholarly activity which results in completion of a master's degree thesis suitable for publication
5. Knowledge of preventive and corrective dental procedures relating to general and oral health and to growth and development of the stomatognathic system
6. Knowledge and skill in oral and maxillofacial radiology specific to the needs of the child and adolescent
7. Preparation for managing a contemporary pediatric dental practice relative to practice administration, efficient auxiliary utilization and marketing
8. Understanding of the biomedical sciences related to the practice of contemporary pediatric dentistry: biostatistics/epidemiology, pharmacology, microbiology, embryology, genetics, anatomy and oral and medical pathology
9. In-depth knowledge of the physical, psychological and social development of children
10. In-depth knowledge of oral and perioral lesions and anomalies in the pediatric dental patient
11. In-depth knowledge of the management of dental and medical emergencies in the dental setting
12. Understanding of normal and abnormal language development
13. Understanding of jurisprudence, risk management and biomedical ethics
14. Understanding office and practice management including the use of contemporary technologies

Clinical competency

1. Ability to appropriately manage and guide the behavior of the child patient to accept needed treatment and to provide advice or guidance to the parent to enhance the child's acceptance
2. Expertise in managing and rendering optimal dental care for the medically, emotionally or physically challenged pediatric dental patient
3. Ability to perform evaluations of the physical status of children and adolescents
4. Ability to transform didactic/learned information into appropriate clinical situations
5. Skill in the use of pharmacologic and nonpharmacologic methods for the comprehensive control of pain and anxiety
6. Ability to recognize, refer and treat children who have sustained abuse and neglect
7. Expertise in dental surgical procedures for the restoration of the dentition
8. Skill/dexterity in performing procedures of periodontal, mucocutaneous and associated hard tissues of the oral-maxillofacial region, including in-depth knowledge of biopsy and adjunctive diagnostic tests
9. Appropriate management of orofacial injuries

Diagnostic skills

1. Ability to recognize the early signs of child abuse and neglect
2. Ability to diagnose dental trauma
3. Skill in the diagnosis, prevention and treatment planning of pediatric disease in the primary and permanent dentition and periodontal, mucocutaneous and associated hard tissues of the oral-maxillofacial region
4. Application and understanding of patient monitoring

Communication skills

1. Competence in the skills required to instruct and motivate children and their caretakers in methods of achieving and maintaining optimum oral health
2. Ability to prepare patients and caretakers for procedures
3. Ability to interact meaningfully with dental and nondental health care providers

4. Ability to work cooperatively with consultants and clinicians of other specialties and health-related fields

Organizational skills and documentation

1. Coordination of tasks such that diagnosis, case analysis, treatment planning and clinical management of oral-facial health problems of the pediatric dental patient occur in a logical, efficient manner
2. Ability to present an organized treatment plan to the patient, parent, attending and front desk
3. Ability to manage time and tasks and to work effectively with people

Research

1. Coordination and implementation of a research project
2. Successful completion of a research project, thesis preparation and thesis defense

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.D.	Fall (Jul 1 start date)	Sep 15	National Dental Boards, Part 1 and 2

Special requirements

- Applicants from countries where English is not the primary and official language must complete the TOEFL.
- Upon acceptance in the specialty certificate program in pediatric dentistry, applicants must apply to the Graduate School for the M.S.D.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. D.D.S. or D.M.D. from an American Dental Association-accredited dental school
2. Successful completion of Part I of the National Dental Board Exam at the time of application and completion of Part II by the time of matriculation
3. Minimum grade point average of 3.0 (4.0 scale) or equivalent
4. Ranking in the top 50 percent of the class of the dental school attended
5. Personal interview
6. An externship in pediatric dentistry of at least one week in duration while attending dental school (highly encouraged)
7. Participation status with American Dental Education Association Postdoctoral Application Support Service and the Postdoctoral Dental Matching Program
8. Agreement to participate in the Postdoctoral Dental Matching Program
9. Agreement to participate in the ADEA PASS
10. Graduation or anticipated graduation from a CODA-accredited U.S. or Canadian dental school
11. Eligibility to obtain a Virginia Temporary Resident's License from the Virginia Board of Dentistry
12. Completion of GRE
13. Completion of TOEFL or IELTS for students whose native language is not English
14. Application to the pediatric graduate program is accepted through the ADEA PASS program. The PASS application should include the following items:

a. Online application form
b. Essay/personal statement: Please tell us about your personal history that led you to apply for an educational program in pediatrics. Include your plans for the future and any factors you believe are important for us to know in reviewing your application. Please limit your comments to one page.
c. Curriculum vitae/resume: Include a curriculum vitae/resume to give us more information about yourself. Include your education and work experiences, awards, honors, research experiences, and personal interests.
d. Undergraduate college transcripts: Include official transcripts from all colleges or universities you attended before dental school.
e. Dental school transcripts
f. Institution Evaluation Form (completed by the dean of your dental school)
g. Personal potential index report (evaluation of different criteria by three to five evaluators compiled into a single report)
h. Professional evaluations: two letters of recommendation from individuals who can personally attest to your professional and personal qualities (the program director's letter can count as one). A letter from the chair of pediatrics is not required, but may be included if the chair has personal knowledge of your skills. **Note: Professional evaluations are listed as optional for PASS; however, they must be submitted for VCU's program.**

Special admission requirements

International applicants must complete the following requirements and documentation. Permanent U.S. residents and international students are advised to contact VCU International Admissions (http://international.admissions.vcu.edu) to ensure eligibility.

1. D.D.S. or D.M.D. from an international dental school program
2. Provide all information in items 1 through 7 above
3. Test of English as a Foreign Language (http://www.ets.org/toefl) (minimum score of 600 on paper-based test and 100 on Internet-based test)
4. International English Language Testing System (http://www.ielts.org) (score of 6.5 or greater acceptable; test must be taken within two years of application date)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a cumulative GPA of 3.0 must be maintained. Students must receive a minimum grade of B for all required courses. Students will take written and oral examinations and must obtain a minimum grade of B or a passing grade. If either is not obtained then the examination must be retaken. For research the student must have a thesis defense and present a poster by mid-April of their second year. Extensions may be approved but at the students own expense.

Curriculum requirements

Course	Title	Hours
DENS 550	Update in Practice Administration	1
DENS 580	Biostatistics and Research Design in Dentistry (two credits taken twice)	4
DENS 660	Interdisciplinary Care Conference (0.5 credits earned twice) [1]	1
DENS 699	Thesis Guidance (two credits taken four times)	8
DENS 700	Basic Sciences and Graduate Dentistry	3
ORTH 620	Orthodontic Clinic for Non-orthodontic Graduate Students (one credit taken four times)	4
PEDD 511	General Anesthesia Rotation	3
PEDD 512	Growth and Development	1
PEDD 514	Introduction to Pediatric Dentistry	2
PEDD 572	Pediatric Dental Emergency Service (2.5 credits taken twice)	5
PEDD 612	Seminar Series: Pediatric Dentistry and Medicine (two credits taken two times)	4
PEDD 620	Pediatric Medicine Rotation	1.5
PEDD 640	Clinical Teaching (two credits taken three times)	6
PEDD 650	Literature Review (two credits taken two times)	4
PEDD 654	Treatment Planning Seminar (one credit taken four times)	4
PEDD 656	Current Literature Review (one credit taken two times)	2
PEDD 680	Pediatric Dental Clinic (four credits taken four times)	16
Total Hours		69.5

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two .5-credit classes.

Total graduate credit hours required (minimum) 69.5

Plan of study

Year one

Fall semester		**Hours**
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 660	Interdisciplinary Care Conference (no credit earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ORTH 620	Orthodontic Clinic for Non-orthodontic Graduate Students	1
PEDD 514	Introduction to Pediatric Dentistry	2
PEDD 572	Pediatric Dental Emergency Service	2.5
PEDD 612	Seminar Series: Pediatric Dentistry and Medicine	2
PEDD 620	Pediatric Medicine Rotation	1.5
PEDD 654	Treatment Planning Seminar	1
PEDD 656	Current Literature Review	1
PEDD 680	Pediatric Dental Clinic	4
	Term Hours:	19

Spring semester

DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
DENS 700	Basic Sciences and Graduate Dentistry	3
ORTH 620	Orthodontic Clinic for Non-orthodontic Graduate Students	1
PEDD 511	General Anesthesia Rotation	3
PEDD 512	Growth and Development	1
PEDD 572	Pediatric Dental Emergency Service	2.5
PEDD 612	Seminar Series: Pediatric Dentistry and Medicine	2
PEDD 640	Clinical Teaching	2
PEDD 650	Literature Review	2
PEDD 654	Treatment Planning Seminar	1
PEDD 656	Current Literature Review	1
PEDD 680	Pediatric Dental Clinic	4
	Term Hours:	27
Year two		
Fall semester		
DENS 550	Update in Practice Administration	1
DENS 660	Interdisciplinary Care Conference (no credit earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	2
ORTH 620	Orthodontic Clinic for Non-orthodontic Graduate Students	1
PEDD 640	Clinical Teaching	2
PEDD 650	Literature Review	2
PEDD 654	Treatment Planning Seminar	1
PEDD 680	Pediatric Dental Clinic	4
	Term Hours:	13
Spring semester		
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	2
ORTH 620	Orthodontic Clinic for Non-orthodontic Graduate Students	1
PEDD 640	Clinical Teaching	2
PEDD 654	Treatment Planning Seminar	1
PEDD 680	Pediatric Dental Clinic	4
	Term Hours:	10.5
	Total Hours:	69.5

[1]

Students register for .5 credits for both fall and spring semesters for both years of the program. They receive a continuing grade in the fall semester and a pass/fail grade at the end of the spring semester for the entire year. Students take the class four times for .5 credits each time, but they are only graded for two one-credit classes.

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Program website: pediatricdentistry.vcu.edu (http://www.pediatricdentistry.vcu.edu)

Dentistry, Master of Science in (M.S.D.) with a concentration in periodontics

Program accreditation
Commission on Dental Accreditation of the American Dental Association

Program goals and objectives

The didactic requirements of the M.S.D. are combined with the goals of the M.S.D. program to provide the student with a strong clinical background which is supported by a strong background in research methodology.

Program goals

1. To provide an academic environment for inquiry in which expertise and knowledge in basic sciences and clinical periodontics can be achieved
2. To provide a sound background in medicine as it applies to the periodontal patient
3. To provide a sound background in oral pathology
4. To be able to interpret, critique and apply periodontal and associated literature
5. To develop sound diagnostic, clinical, nonsurgical and surgical skills
6. To provide didactic instruction and clinical training in the area of dental implants
7. To provide methods of pain and anxiety control, including ADA certification in intravenous conscious sedation
8. To provide an environment for the interpretation and implementation of research
9. Enable successful completion of the American Board of Periodontology exam
10. To develop sound lifelong didactic and clinical learning skills
11. To provide specialists in periodontics for community health care, professional service and dental education

Program objectives

1. To be exposed to the basic sciences and be able to apply concepts to clinical periodontics
2. To be able to critically critique and interpret the old and new literature
3. To have an understanding of oral pathology and medicine as it applies to management of the periodontal patient
4. To have residents become exposed to and proficient in multiple nonsurgical and surgical treatment modalities
5. To become competent in the treatment planning, site preparation, surgical placement and maintenance of dental implants
6. To obtain competency and certification in enteral and parental conscious sedation
7. To complete research, M.S.D. and prepare a paper for presentation and publication

8. To prepare the student to successfully complete Part I and II of the American Board of Periodontology examination
9. To develop communication and presentation skills and lifelong learners

Student learning outcomes

1. To provide an academic environment for inquiry in which expertise and knowledge in basic sciences and clinical periodontics are achieved
2. To provide a sound background in medicine as it applies to the periodontal patient
3. To provide a sound background in oral pathology with a100 percent completion of oral pathology rotation
4. To be able to interpret, critique and apply periodontal and associated literature with a 100 percent completion of periodontal courses measured
5. To develop sound diagnostic clinic, nonsurgical and surgical skills
6. To provide didactic instruction and clinical training in the area of dental implants
7. To provide methods of pain and anxiety control, including ADA certification in intravenous conscious sedation
8. To provide an environment for the interpretation and implementation of research with a100 percent successful completion of biostatistics and research design in dentistry course
9. Enable successful completion of the American Board of Periodontology written and oral examinations
10. To develop sound lifelong didactic and clinical learning skills
11. To provide specialists in periodontics for community health care, professional service and dental education with a 100 percent graduate participation in specialty clinical practice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.D.	Fall (Jul 1 start date)	Jul 1, a year previous to entry	National Dental Boards, Part 1 and 2

Special requirements

- Applicants from countries where English is not the primary and official language must complete the TOEFL with a score of 100 or higher.
- International applicants must include an external credential evaluation of all international transcripts to complete the application. WES, ECE and AACRAO are some of the recommended NACES-approved providers.
- Upon acceptance in the specialty certificate program in periodontics, applicants must apply to the Graduate School for the M.S.D.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. D.D.S. or D.M.D. degree from U.S. or Canadian dental school
2. Part I of the National Dental Board at the time of application and Part II by time of matriculation (official report or certified copy)
3. Transcripts in a sealed envelope from each college/university/dental program attended
4. GPA/class ranking forwarded from the dean's office of the dental school attended
5. Three letters of recommendation addressed to the director of graduate periodontics

6. Curriculum vitae and personal statement
7. Interview upon request from program director

Special admission requirements

International applicants must complete the following requirements and documentation. Permanent U.S. residents and international students are advised to contact VCU International Admissions (http://international.admissions.vcu.edu) to ensure eligibility.

1. D.D.S. or D.M.D. from an international dental school program
2. Provide all information in items three through seven above
3. An external credential evaluation for international applicants of all international transcripts to complete the application (WES, ECE and AACRAO are some of the recommended NACES-approved providers.)
4. TOEFL with a minimum score of 100 for applicants from countries where English is not the primary and official language

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a cumulative GPA of 3.0 must be maintained. Students must receive a minimum grade of B for all required courses. Students will take written and oral examinations and must obtain a minimum grade of B or a passing grade. If either is not obtained, then the examination must be retaken. For research the student must have a thesis defense, present a poster and prepare a manuscript for submission by May 1 of the third year. Extensions may be approved, but students are responsible for the expense.

Curriculum requirements

Course	Title	Hours
DENS 550	Update in Practice Administration	1
DENS 580	Biostatistics and Research Design in Dentistry (two credits taken twice)	4
DENS 630	Orthodontic-Periodontic-AEGD Conference (0.5 credits taken six times) [1]	3
DENS 660	Interdisciplinary Care Conference (0.5 credits earned three times) [1]	1.5
DENS 699	Thesis Guidance (1.5 credits taken six times)	9
DENS 700	Basic Sciences and Graduate Dentistry	3
PERI 508	Physical Diagnosis	2
PERI 511	Anesthesiology Rotation	1.5
PERI 512	Conscious Sedation (two credits taken twice)	4
PERI 514	Introduction to Periodontics	3
PERI 520	Principles of Periodontics (two credits taken twice)	4
PERI 552	Implantology	1
PERI 619	Clinical Pathology Rotation	0.5
PERI 630	Medicine: Oral Medicine Seminar (1.5 credits taken six times)	9
PERI 650	Periodontal Literature Review (three credits taken six times)	18
PERI 654	Treatment Plan: Case Presentations (one credit taken six times)	6
PERI 656	Current Literature Review (three credits taken six times)	18
PERI 680	Clinical Periodontics (five credits taken six times)	30
PERI 719	Specialty Practice Management	0.5
Total Hours		119

[1]

For DENS 660, students register for .5 credits for both fall and spring semesters of all three years of the program. They receive a continuing grade in the fall semester and grade at the end of the spring semester for the entire year. Students take the class six times for .5 credits each time, but they are only graded for three 0.5 credit classes

Total graduate credit hours required (minimum) 119

Plan of study

Year one

Fall semester		**Hours**
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 630	Orthodontic-Periodontic-AEGD Conference	0.5
DENS 660	Interdisciplinary Care Conference (no credits earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	1.5
PERI 508	Physical Diagnosis	2
PERI 512	Conscious Sedation	2
PERI 514	Introduction to Periodontics	3
PERI 520	Principles of Periodontics	2
PERI 552	Implantology	1
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
	Term Hours:	27.5
Spring semester		
DENS 580	Biostatistics and Research Design in Dentistry	2
DENS 630	Orthodontic-Periodontic-AEGD Conference [1]	0.5
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	1.5
DENS 700	Basic Sciences and Graduate Dentistry	3
PERI 511	Anesthesiology Rotation	1.5
PERI 512	Conscious Sedation	2
PERI 520	Principles of Periodontics	2
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
	Term Hours:	26.5

Year two

Fall semester		
DENS 630	Orthodontic-Periodontic-AEGD Conference	0.5
DENS 660	Interdisciplinary Care Conference (no credit earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	1.5
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
	Term Hours:	15.5
Spring semester		
DENS 630	Orthodontic-Periodontic-AEGD Conference	0.5
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	1.5
PERI 619	Clinical Pathology Rotation	0.5
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
	Term Hours:	16.5
Year three		
Fall semester		
DENS 550	Update in Practice Administration	1
DENS 630	Orthodontic-Periodontic-AEGD Conference	0.5
DENS 660	Interdisciplinary Care Conference (no credit earned in fall; continuing course) [1]	-
DENS 699	Thesis Guidance	1.5
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
PERI 719	Specialty Practice Management	0.5
	Term Hours:	17
Spring semester		
DENS 630	Orthodontic-Periodontic-AEGD Conference	0.5
DENS 660	Interdisciplinary Care Conference [1]	0.5
DENS 699	Thesis Guidance	1.5
PERI 630	Medicine: Oral Medicine Seminar	1.5
PERI 650	Periodontal Literature Review	3
PERI 654	Treatment Plan: Case Presentations	1
PERI 656	Current Literature Review	3
PERI 680	Clinical Periodontics	5
	Term Hours:	16
	Total Hours:	119

[1]

For DENS 660, students register for .5 credits for both fall and spring semesters of all three years of the program. They receive a continuing grade in the fall semester and a grade at the end of the spring semester for the entire year. Students take the class six times for .5 credits each time, but they are only graded for three .5-credit classes.

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Oral Health Research, Doctor of Philosophy (Ph.D.)

The Ph.D. in Oral Health Research prepares students for research-oriented careers as independent scientists in academia, government and industry. The curriculum is specifically designed to provide a strong foundation in biochemistry, molecular biology and oral biology. Students will select a research project from one of three main areas of focus:

- Cancer and developmental biology of the head and neck
- Infection and immunology in diseases of the head and neck
- Tissue engineering, stem cells and new materials for the orofacial region

These areas correspond to the critical areas identified by the National Institute for Dental and Craniofacial Research. The program emphasizes independent research culminating in the conduct of an original research project under the supervision of a faculty adviser. Participating faculty are associated not only with programs and departments within the Philips Institute for Oral and Craniofacial Molecular Biology within the School of Dentistry, but also the VCU Massey Cancer Center and VCU's College of Engineering.

Ph.D. students are expected to enroll as full-time graduate students. During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Following completion of the research project and defense of the doctoral dissertation, graduates will have acquired the necessary methods, techniques and critical-thinking skills to become the next generation of scientific leaders.

Student learning outcomes

- Graduates will have acquired fundamental knowledge of oral health research and strength in cutting-edge research that crosses disciplines and fosters the ability of the students to view oral health research questions from a broad perspective.
- Graduates will have an understanding of the structure, function and development of tissues of the oral and craniofacial region.
- Graduates will be able to evaluate molecular mechanisms associated with head and neck cancer and design research programs to improve treatment.

- Graduates will be able to evaluate infectious and immune diseases of the head and neck and design research programs to improve treatment.
- Graduates will be able to evaluate the use of bioengineering for diseases of the head and neck and design research programs to improve treatment.
- Graduates will have developed strong practical foundations on which to build research careers.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall		

Special requirements

- Applicants whose native language is not English must submit satisfactory scores from a standardized test commonly used and deemed appropriate for evaluation of English language proficiency, such as the TOEFL. These scores should be 80 minimum for Internet-based tests, 213 minimum for computer-based tests and 550 minimum for paper-based tests.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

- A minimum GPA of 3.0 on a 4.0 scale
- A personal statement, which should include long-term career goals to assess reasons behind the candidate's application; how a Ph.D. helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
- A current resume or curriculum vita
- Three letters of recommendation that speak to the scientific competency and experience of the applicant

Degree requirements

For students with a B.S. degree, the Ph.D. in Oral Health Research will require the completion of a minimum of 102 credits, including a minimum of 35 didactic credit hours comprising seven required courses (12 credits), six core courses (15 credits) and additional electives (eight credits). The remaining 67 credits (at minimum) will be taken in research courses.

Students entering the program with an M.S. will be required to complete a minimum of 81 credits, including a minimum of 23 didactic credit hours comprising six core courses (15 credits) combined with electives (eight credits). These students must also complete the research requirements for a minimum of 58 credits.

Students entering the program with a D.D.S or D.M.D. will be required to complete a minimum of 84 credits, including a minimum of 24 didactic credits comprising five required course (six credits), four core courses (10 credits) and electives (eight credits). These students must also complete the research requirements for a minimum of 60 credits.

Curriculum requirements for students entering with a B.S.

Course	Title	Hours
Required courses		
BIOC 530 & BIOC 531 & BIOC 532 & BIOC 533	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function and Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism and Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology and Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	5
or BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOS/STAT 543	Graduate Research Methods I	3
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Core courses		
OCMB 701	An Introduction to Oral Biology	2
OCMB 702	Oral Pathogenesis	2
OCMB 703	Research Topics in Oral Biology	1
OCMB 704	Oral Biology Seminar Series (one-credit course taken eight semesters)	8
OCMB 706	Proposal Preparation	1
OCMB 707	Research Skills and Career Development	1
Electives		
Choose eight credit hours		8
Research requirement		
OCMB 705	Oral Biology Oral Biology Directed Research (taken for a minimum of 67 credits)	67
Total Hours		102

Curriculum requirements for students entering with an M.S.

Course	Title	Hours
Core courses		
OCMB 701	An Introduction to Oral Biology	2
OCMB 702	Oral Pathogenesis	2
OCMB 703	Research Topics in Oral Biology	1
OCMB 704	Oral Biology Seminar Series (one-credit course taken eight semesters)	8
OCMB 706	Proposal Preparation	1
OCMB 707	Research Skills and Career Development	1
Electives		
Choose eight credit hours		8
Research requirement		
OCMB 705	Oral Biology Oral Biology Directed Research (taken for a minimum of 58 credits)	58
Total Hours		81

Curriculum requirements for students entering with a D.D.S. or D.M.D

Course	Title	Hours
Required courses		
BIOC 530 & BIOC 531 & BIOC 532 & BIOC 533	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function and Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism and Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology and Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	5
or BIOC 503	Biochemistry, Cell and Molecular Biology	
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Core courses		
OCMB 703	Research Topics in Oral Biology	1
OCMB 704	Oral Biology Seminar Series (one-credit course taken seven semesters)	7
OCMB 706	Proposal Preparation	1
OCMB 707	Research Skills and Career Development	1
Electives		
Choose eight credit hours		8
Research requirement		
OCMB 705	Oral Biology Oral Biology Directed Research (taken for a minimum of 60 credits)	60
Total Hours		84

Students with an interest in academic and research careers are afforded the opportunity to undertake advanced degree training while in dental school by combining doctoral study in oral health research with a professional degree in dentistry. The program seeks to train students interested in translating oral research to the clinic. These clinician-scientists will help bridge the gap between basic and clinical science in the field of dentistry. For more information, see the program page in the Professional Bulletin (http://bulletin.vcu.edu/professional-studies/dentistry/dds-phd-oral-health-research).

Graduate program director
Oonagh Loughran, Ph.D.
Associate professor
Email: oloughran@vcu.edu
Phone: (804) 828-3910

Program website: dentistry.vcu.edu/programs/oralhealthphd (http://dentistry.vcu.edu/programs/oralhealthphd)

Advanced Dental Education

Patrice N. Gray
Director, marketing and continuing education

Office of Continuing Education

For every professional person who serves the health sciences, education must be a lifetime commitment.

Graduation from dental school is the beginning of a lifelong educational experience for the serious, conscientious student of dentistry. Regardless of how well-prepared a health professional may be at the time of graduation, the adequate knowledge of yesterday is often insufficient information for today and tomorrow. With the rapid advancements made in dental technology and techniques, the professional must constantly seek new knowledge if the health care provider is to improve the health care given to patients.

Although the majority of continuing education courses are presented at the School of Dentistry, some are offered in other locations. The courses, which vary in length from one to four days, are scheduled throughout the year and consist of a variety of instructional methods from didactic to hands-on participation in clinical programs.

The instructional staff comprises faculty from the VCU School of Dentistry, guest lecturers from other dental schools and members of the dental profession and related professions from the United States and other countries.

Advanced Dental Education programs

The School of Dentistry provides advanced dental education programs in the areas of endodontics, oral and maxillofacial surgery, orthodontics, pediatric dentistry, periodontics and advanced education in general dentistry. Satisfactory completion of the program leads to the award of a certificate of training and certifies eligibility for examination by the appropriate specialty board. All programs are accredited by the Commission on Dental Accreditation of the American Dental Association. Those enrolled in the advanced education programs are full-time resident trainees, considered to be the equivalent of full-time students. Under special circumstances, trainees may be accepted into some programs on a part-time basis.

Students enrolling in endodontics, orthodontics, pediatric dentistry and periodontics also are awarded a Master of Science in Dentistry degree upon completion of the requirements for the certificate and successful defense of a thesis. The certificate program and Master of Science in Dentistry degree must be completed concurrently. See the School of Dentistry graduate program for more information on the Master of Science in Dentistry degree program.

Applications for admission should be directed to the director of the appropriate program, School of Dentistry, Virginia Commonwealth University, Box 980566, Richmond, VA 23298-0566. Successful completion of Part II of the National Board Dental Examination is required prior to admittance to the program.

Advanced Education in General Dentistry

Kevin M. Noall, D.D.S.
Program director

The purpose of this 12-month advanced dental education residency program is to provide advanced education and clinical experience to prepare dental school graduates for a career in the practice of comprehensive, general dentistry. This program has a strong emphasis on treatment planning, experience with new technology, developing skills in aesthetic dentistry and restoration of dental implants. Graduates of this program will have attained added competency and confidence in all areas of dental care, practice management and professional responsibility. Further, this program provides residents with meaningful experiences in the delivery of dental care to diverse populations and people at high risk for dental disease. A strong affiliation exists between the School of Dentistry and the statewide Virginia Area Health Education Center, whose mission is to increase primary health care in underserved areas. The AEGD program works in concert with AHEC to deliver dental care and recruit/train minority health care providers from health professional shortage areas.

The School of Dentistry is committed to advanced dental education. The residents will receive hands-on experience with diagnostic and therapeutic care of special patient populations in addition to extensive training in the art and science of general dentistry. AEGD residents may be required to participate in off-site clinical experiences outside the city of Richmond, Virginia. Funds will be provided for travel and lodging when required.

Eligibility and selection

Dentists with the following qualifications are eligible to apply for the AEGD program: Dental graduates from institutions in the United States accredited by the Commission on Dental Accreditation of the American Dental Association and who have passed Part I of the National Board Examination.

Selection criteria include didactic and clinical achievements, extramural experience, interpersonal skills and a demonstrated commitment to pursue a career in general dentistry. Every effort is made to recruit qualified applications from minority dentists and dentists from health professional shortage areas or dentists who profess a desire to serve in these areas. A selection committee consisting of the program director, the assistant dean for admissions, members from specialty areas, former residents and current residents will screen all applications. Using the above-mentioned selection criteria, the most promising applicants will be invited for personal interviews. Trainees and alternates will be selected. This program participates in the Postdoctoral Application Support Service Program. Phone (804) 828-3601; fax (804) 828-3159; email drhaselton@vcu.edu.

Endodontics

Garry L. Myers, D.D.S.
Program director

The advanced dental education program in endodontics offers the student a comprehensive 24-month course of study in clinical, didactic and research endodontics. The program is designed to educate qualified individuals to pursue careers as educators, researchers and practicing clinicians, and meets the educational requirements for limitation of practice to the specialty of endodontics and examination by the American Board of Endodontics. The program is composed of several interrelated phases. The first phase consists of lecture courses that provide the student with a firm biological basis for patient care. The second phase consists of lectures, seminars and clinical training designed to produce clinical mastery of endodontics. The third phase is research experience gained through completion of an individual research project and master's thesis.

Students completing the program earn a specialty certificate in endodontics and a Master of Science in Dentistry degree. Students must complete the requirements for the master's degree prior to being awarded the specialty certificate.

The program conforms to the Standards for Advanced Specialty Education in Endodontics and carries a full approval status from the Commission on Dental Accreditation of the American Dental Association.

Oral and Maxillofacial Surgery

Robert A. Strauss, D.D.S., M.D.
Professor and program director

The oral and maxillofacial surgery program is designed to provide extensive didactic and clinical experience in all aspects of the specialty. Those who complete training satisfactorily fulfill the prerequisites for examination and certification by the American Board of Oral and Maxillofacial Surgery.

The didactic portion of the program includes formal courses in oral pathology, anatomy and physical diagnosis, as well as numerous weekly conferences and seminars. Clinical rotations on oral pathology, anesthesia, medicine, surgical oncology, neurosurgery, cardiology, general surgery, emergency room and the trauma services are used to supplement the trainee's surgical experience. Throughout the program there is a constant correlation of the clinical experience with the biomedical sciences.

Through the multiple clinical and didactic facilities of the VCU Medical Center complex, the McGuire Veterans Affairs Medical Center and St. Mary's Hospital, there is ample material for education in the latest oral and maxillofacial surgical techniques. The oral and maxillofacial surgery service is responsible for diagnosis and management of diseases and injuries related to the oral and facial region. Trainees are involved in all aspects of treatment including simple and complicated oral surgery, anesthesia and pain control, oral and maxillofacial trauma, pre-prosthetic surgery, orthognathic surgery, head and neck pathology, oral and maxillofacial reconstruction, temporomandibular joint surgery, laser surgery, cosmetic facial surgery, and microneural and microvascular surgery. During the four years, the trainee assumes ever-increasing responsibilities as time and abilities dictate.

Upon satisfactory completion of the four-year residency, the trainee may earn the Doctor of Medicine degree from the School of Medicine by enrolling in the second and third years of that curriculum.

Orthodontics

Bhavna Shroff, D.D.S.
Professor and program director

The Department of Orthodontics in VCU's School of Dentistry offers a 24-month advanced education in orthodontics and Master of Science in Dentistry program. The program teaches state-of-the-art clinical care in an environment modeled after private orthodontic practice. The curriculum is composed of seminars and small-group instruction with emphasis on critical-thinking and problem-solving. Contemporary concepts of orthodontic treatment are reviewed for substantive and scientific content. Also included are regularly scheduled orthognathic surgery conferences and seminars with other dental and medical specialists.

The postgraduate program is designed to develop skilled practitioners who are prepared to grow with the future and manage busy orthodontic practices. The goal is not only to familiarize future orthodontists with contemporary techniques but also to teach them how to interpret cutting-edge scientific information and use it to approach clinical challenges logically and practically. Clinical experience consists of a wide variety of orthodontic patients, including complex cases requiring orthognathic surgery and patients with facial clefts and other craniofacial abnormalities. An original research experience is an integral part of the program, with each project intended to produce results suitable for publication in a nationally circulated orthodontic journal. The successful completion of a research project is a requirement of the program. All senior residents present their research at the Virginia Association of Orthodontists meeting. The program qualifies students to take the written portion of the American Board of Orthodontics examination in the senior year. Residents are required to take the written portion of the American Board of Orthodontics examination prior to graduation and are encouraged to continue and complete the board certification process. This exam is given prior to the American Association of Orthodontists meeting.

Students completing the program earn a specialty certificate in orthodontics and Master of Science in Dentistry degree. Students must complete the requirements for the master's degree prior to being awarded the specialty certificate.

The program is accredited by the Commission on Dental Accreditation of the American Dental Association.

Pediatric Dentistry

William O. Dahlke, D.M.D.
Associate professor and program director

The advanced education program in pediatric dentistry offers the student a comprehensive 24-month course of study in clinical and didactic pediatric dentistry. The program is designed to meet the educational requirements for limitation of practice to the specialty of pediatric dentistry and examination by the American Board of Pediatric Dentistry. The program emphasizes a diversified educational experience. The program places emphasis on all phases of pediatric dentistry including trauma, preventive dentistry, restorative, endodontics, periodontics, oral surgery, orthodontics and hospital dentistry. The program enables the student to provide comprehensive oral health care for the well child, the medically compromised and children with special needs. There is extensive use of various treatment modalities for pain control and behavioral management, such as sedation, analgesia and general anesthesia. Research experience is gained through completion of an individual research project and master's thesis.

Seminars are held in pediatric dentistry, orthodontic diagnosis and treatment, treatment planning, growth and development, cephalometric analysis, pediatric dentistry literature review, and behavior guidance. Formal courses in biostatistics, principles of pediatrics, pediatric advanced life support, head and neck anatomy, neurodevelopmental disabilities, leadership seminars, basic sciences and clinical core courses are required. The students participate in undergraduate clinical teaching and supervision.

One-month rotations occur in general anesthesia, and two-week rotations occur in the pediatric emergency room and pediatric medicine. During the year, rotations in cleft palate, craniofacial anomalies and hemophilia occur. Optional elective rotations are available in treating institutionalized handicapped patients (in Lynchburg). Elective didactic courses also are available.

Students completing the program earn a specialty certificate in pediatric dentistry and a Master of Science in Dentistry degree. Students must complete the requirements for the master's degree prior to being awarded the specialty certificate.

The program is accredited by the Commission on Dental Accreditation of the American Dental Association.

Periodontics

Thomas C. Waldrop, D.D.S.
Professor and program director

The advanced education program in periodontics consists of a 36-month clinical and didactic curriculum leading to a certificate in periodontics. Students are responsible for all materials and make up of lost clinical time. Courses in the basic and clinical sciences, medicine, head and neck anatomy, statistics and advanced cardiac life support are required. Students are responsible for attending and preparing for lectures, current and periodontal literature, medical-oral medicine, treatment planning, case presentation and surgical seminars. No grade less than 80 percent or passing is acceptable from any periodontal or basic science course work. Less than passing grades may require retesting or retaking of a course. Students are expected to be able to utilize a computer to prepare lectures and to access Internet resources.

Students are responsible for documentation of clinical and course work data. Specified digital intra-oral camera and documentation of all clinical cases and department archiving is required. Students are responsible to the service for rotations in general medicine, dental anesthesiology and oral pathology. Proficiency and certification in intravenous conscious sedation is required. Students are responsible for clinical and classroom teaching to undergraduate and specialty students. Research on a topic that is reviewed and approved by a faculty committee is required. Upon completion of the research, the student is required to prepare a thesis, defense and manuscript for publication. Certificates are not awarded until completion of the Master of Science in Dentistry requirements. Students are responsible for the purchase of program-required equipment, instruments, books and all associated fees. All students are required to become student members of the American Academy of Periodontology.

Department of Endodontics

Clara M. Spatafore, D.D.S.
Interim chair

The Department of Endodontics is dedicated to providing quality endodontic dental care services as well as advancing new knowledge through teaching, research, community involvement and patient care. The faculty participate in the training of predoctoral dental students in the area of clinical endodontics. After an introduction to the specialty in their first year, students learn and develop didactic and treatment skills during preclinical classes and labs in the second year. Advanced topics and clinical techniques are stressed in the third year, which allows patient treatment during the third and fourth years. In the fourth year, students are prepared for dental board examinations and are given the opportunity to treat a variety of clinical cases in both the School of Dentistry and off-site service-learning clinics.

Department of Orthodontics

Steven J. Lindauer, D.M.D., M.D.Sc.
Professor and chair

The Department of Orthodontics is dedicated to providing the best and latest care to patients, as well as offering the best preparation for graduate orthodontic residents. The department offers a 24-month advanced education Master of Science in Dentistry program. The program teaches state-of-the-art clinical care in an environment modeled after private orthodontic practice.

Department of Pediatric Dentistry

Tegwyn H. Brickhouse, D.D.S., Ph.D.
Associate professor, research director and chair

The vision of the VCU Department of Pediatric Dentistry focuses on the oral health of the growing and developing child and how oral health impacts the overall health of the individual, which in turn informs a multidisciplinary approach to prepare students and residents for a rapidly evolving health care environment. The VCU Department of Pediatric Dentistry is committed to clinical excellence, innovative educational initiatives and forging ahead with translational research.

Department of Periodontics

Harvey A. Schenkein, D.D.S., Ph.D.
Paul Tucker Goad Professor and chair

Faculty in the Department of Periodontics participate in the training of predoctoral dental students by emphasizing the evidence-based underpinnings of contemporary periodontics while providing innovative educational instruction. The department also trains specialists in periodontics via its postgraduate program. Furthermore, faculty provide outstanding care to patients through VCU Dental Care, the faculty practice of the VCU School of Dentistry.

SCHOOL OF EDUCATION

The Virginia Commonwealth University School of Education prepares effective, highly skilled teachers, counselors, school administrators, higher education faculty and other education professionals committed to making a difference in the lives of children and adults and their communities, particularly in urban and high-need environments.

Located on the university's Monroe Park Campus, the School of Education has a strong commitment to social justice, diversity and inclusion among students, faculty and staff, as well as in its academic programs.

The School of Education offers two doctoral programs, three master's programs and 15 certificate/endorsement programs.

The guiding theme of educator preparation programs in the School of Education is **educator as critically reflective practitioner**. Courses and experiences provide opportunities for individuals to be engaged in meaningful dialog about the nature and application of appropriate knowledge and skills to make instructional, assessment, counseling and leadership decisions that improve student learning.

The school has 60 full-time faculty and an additional 55 teaching and research faculty, many of whom are internationally renowned experts who produce and disseminate scholarship that extends knowledge, improves practice and collaboration, and supports schools and educational and human service agencies.

Administration

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Andrew P. Daire, Ph.D.
Professor and dean

Colleen A. Thoma, Ph.D.
Professor and associate dean for academic affairs and graduate studies

Kathleen M. Rudasill, Ph.D.
Associate dean for research and faculty development

Joan B. Johnson, Ph.D.
Executive director for accreditation and licensure

Accreditation

Education (all degrees)

National Council for Accreditation of Teacher Education (initial licensure and advanced degrees for school personnel), the Virginia Department of Education and the Southern Association of Colleges and Schools.

Counselor education

Accredited by the Council on Accreditation of Counseling and Related Educational Programs

This accreditation applies to both the K-12 school counseling track and the college student development and counseling track.

The school holds membership in the American and Virginia Association of Colleges of Teacher Education and in the Holmes Partnership.

Organization

The chief administrative office for the School of Education is Oliver Hall, Room 2090. The dean is responsible for the overall operation of the school, while two associate deans and an executive director (associate dean for academic affairs and graduate studies, associate dean for research and faculty development, executive director for licensure and accreditation) assist in the school's administrative functions.

The school contains four academic departments: Counseling and Special Education, Educational Leadership, Foundations of Education, and Teaching and Learning. The school also supports eight centers and institutes:

- Center for School Community Collaboration
- Center for Sport Leadership
- Center for Teacher Leadership
- Child Development Center
- Metropolitan Educational Research Consortium
- Partnership for People with Disabilities
- Rehabilitation Research and Training Center
- The Literacy Institute

Facilities

The School of Education is housed primarily in Oliver Hall, where classroom, laboratory and activity centers, as well as faculty and administrative offices can be found. Clinical laboratories are located at 3600 W. Broad St. The affiliated centers have various locations close to the Monroe Park Campus.

Support/resource offices

The School of Education has several offices that provide support services to students and faculty. These offices include the Office of Graduate Studies, Student Services Center, Office of Assessment, Office of Communications and Enrollment Management, and Instructional Technology Services.

Office of Graduate Studies

The Office of Graduate Studies assists all departments with admission, matriculation, graduation, and special actions and appeals for graduate students. The office also supports and guides students throughout their graduate program, fostering a learning community that enhances students' professional development.

Student Services Center

The Student Services Center provides support for teacher education and counselor education students as they progress through their academic programs. Services include:

- Advising for students in extended teacher preparation, post-baccalaureate, counselor education and special education programs prior to formal admission to graduate programs

- Processing of applications for admission to teacher preparation programs
- Processing of applications for clinical placements and coordinating for practica, student teaching, internships and externships in local school divisions and educational facilities
- Processing applications for licensure in Virginia and other states
- Providing general program and course information
- Assigning faculty advisers
- Entering, retrieving and managing data to document student progress through academic programs
- Serving as a repository of information on comprehensive examinations, application and forms for academic transactions, admission to teacher preparation, clinical experiences, and licensure

Office of Assessment

The Office of Assessment coordinates data collection, analysis and reporting for a variety of purposes, including accreditation, personnel evaluations, student assessment and survey research.

Office of Communications and Enrollment Management

The office coordinates all marketing and communication efforts for the school, provides brand alignment support and works with departments and programs on recruitment efforts. The team maintains the School of Education website, social media channels, and all marketing materials and communications to internal and external stakeholders.

Information Technology Services

The Information Technology Services center provides support and training for faculty, staff and students in the School of Education for various technology resources. The ITS houses both Mac and PC laptops, Chromebooks, netbooks, digital cameras, Promethean board accessories, mobile devices and more for use and checkout by faculty, staff and students. The office provides technical assistance to faculty and staff to assure that issues in using technology are quickly resolved. The center also coordinates two technology resources:

- **Digital playgrounds (rooms 3107 and 3108)**

  Digital playgrounds provide space and equipment that facilitate many opportunities to learn about incorporating computer-assisted instruction in the classroom. The digital playground in Room 3107 is equipped with several computers connected for use of pay-4-print services for students. Both rooms are equipped with smartboards, Promethean boards, 3-D printers, 3-D scanners and more for students to “play” with to develop more effective instruction. Technology devices can be checked out from ITS for use in these areas.

- **Distance-learning technology**

  The ITS also supports three rooms in Oliver Hall with distance-learning technology and provides ongoing assistance to faculty, preservice teachers and staff in the School of Education.

Licensure and reciprocity

Upon completion of degree requirements in any of VCU’s teacher preparation programs and with the recommendation of the School of Education, students are eligible to receive initial teacher licensure from the Virginia Department of Education. For additional information on licensure, licensure renewal or an add-on endorsement, contact the School of Education’s Student Services Center.

In Virginia, initial licensure requires successful completion of state-mandated tests. Passing scores on these tests are required to progress through different portions of the licensure programs from admission to teacher preparation, admission to student teaching and recommendation for licensure. For a list of testing requirements, please refer to the FAQs for teacher candidates on the School of Education website at soe.vcu.edu/student-services-center (http://www.soe.vcu.edu/academics_programs/faqs-for-teacher-candidates).

Students should request that their Praxis scores be reported to VCU.

Before a recommendation for licensure can be sent to the Teacher Licensure Division of the Virginia Department of Education, these test scores must be on file with the School of Education’s Student Services Center.

Licensure for education personnel

Licensure and endorsement are based in part on the successful completion of an approved program developed in response to nationally recognized standards. All licensure and endorsement programs offered by the School of Education are approved by the Virginia Department of Education and the National Council for the Accreditation of Teacher Education. The commonwealth of Virginia is a member of the National Association of State Directors of Teacher Education and Certification, which has a national reciprocity agreement for teacher licensure. Therefore, all licensure and endorsement programs in the School of Education have approved program status and are a part of the NASDTEC Certification Reciprocity Agreement.

Graduate programs leading to initial teacher licensure

Individuals often decide to pursue a teaching career after they have completed a baccalaureate degree. VCU serves qualified individuals through approved programs leading to a Master of Teaching, Master of Education (special education) or a post-baccalaureate Certificate in Teaching. Upon completion of a degree program, graduates are eligible for both Virginia licensure and/or endorsement in the specific degree area.

Individuals who wish to obtain licensure in art education or music education should consult the School of the Arts section of this bulletin.

The Master of Teaching program integrates undergraduate course work for a bachelor’s degree in a liberal arts or science major with course work and graduate study leading to a Master of Teaching in a program area.

Approved programs and certification reciprocity

All of VCU’s initial teacher preparation programs are approved by the Virginia Department of Education and accredited by the Southern Association of Colleges and Schools and the National Council for Accreditation of Teacher Education. VCU’s School of Education also holds membership in the American and Virginia Associations of Colleges for Teacher Education and the Holmes Partnership.

Based on the National Association of State Directors of Teacher Education and Certification agreement, VCU graduates will be eligible for teacher licensure reciprocity with other states. Students interested in

licensure reciprocity should contact the School of Education's Student Services Center.

Programs

Master of Teaching (extended programs)

- Biology education
- Chemistry education
- Early and elementary education
- Earth science education
- English education
- History/social studies education
- Mathematics education
- Physics education

Master of Education

- Adult learning
  - Adult literacy
  - Human resource development
  - Teaching and learning with technology
- Counselor education
  - College student development and counseling
  - School counseling
- Curriculum and instruction
  - Instructional technology
  - Teaching and learning
- Educational leadership
  - Administration and supervision
  - Leadership studies
- Reading
  - K-12 reading specialist
  - Reading with TESOL/adult
  - Reading with TESOL/K-12
  - Without concentration
- Special education
  - Early childhood
  - General education
  - Severe disabilities

Ed.D.

- Leadership

Ph.D.

- Education
  - Art education
  - Counselor education and supervision
  - Curriculum, culture and change
  - Educational leadership
  - Educational psychology
  - Research, assessment and evaluation
  - Special education and disability leadership
  - Sport leadership
  - Urban services leadership

Post-baccalaureate graduate certificates

- Autism spectrum disorder
- Disability leadership
- Instructional technology
- Medical education
- Online teaching for K-12 educators
- Teaching
  - Biology education
  - Chemistry education
  - English education
  - History/social studies education
  - Mathematics education
  - Physics education
- Teaching English to speakers of other languages

Post-master's certificates

- Educational leadership
- Reading specialist

Dual-degree

- Sport leadership (with School of Business)

Extended Teacher Preparation Program

The School of Education, in cooperation with the College of Humanities and Sciences, offers extended teacher preparation programs in early childhood and elementary education (prekindergarten through grade six) and secondary education (grade six through grade 12). The successful completion of these programs results in the simultaneous awarding of both a bachelor's and a master's degree.

General degree requirements

The successful completion of these programs results in the simultaneous awarding of both a bachelor's and a master's degree. Prospective Master of Teaching students earn their bachelor's degree in a specific field in which they plan to teach. A student generally begins work on the professional studies component in the third or fourth year of academic study.

A student enrolled in the extended teacher preparation program must complete a minimum of 153/154 credits. The student must maintain a cumulative GPA of 2.8 for admission to the teacher preparation program. Completion of at least 90 credits with a minimum GPA of 3.0 in the last 60 semester hours of study is required for that student to be admitted to the graduate studies portion of the extended program.

A post-baccalaureate graduate Certificate in Teaching is open primarily to those who have already earned a master's degree. The candidate must complete at least 30 additional hours beyond the bachelor's level. Admittance to this program requires a minimum GPA of 3.0 in the last 60 semester hours of study.

Clinical experiences

All initial licensure programs require clinical experiences throughout the program. During the initial stages of a program, these experiences occur as practica in varied placements in K-12 education relevant to the student's program. The program also requires a capstone clinical experience in the form of student teaching. For student teaching, those

pursuing early and elementary education are placed in two settings, one in early elementary grades (K-2) and one in upper elementary grades (3-5). Those pursuing secondary education receive a single placement in their discipline in a middle school or high school setting.

With the guidance of a clinical faculty member or cooperating teacher, the intern assumes more independence in the field setting. Satisfactory completion of the internship and the preceding training is charted through evaluations made by the university supervisor, clinical faculty or cooperating teacher, and school administrator.

Undergraduate major

Freshman students who plan to become early and elementary education teachers are required to enroll in the Bachelor of Interdisciplinary Studies liberal studies for early and elementary education major. Transfer students should meet with a B.I.S. adviser prior to course registration. The B.I.S. degree requirements are outlined in the College of Humanities and Sciences section of this bulletin.

Prospective secondary teachers should major in the discipline they wish to teach. The disciplines in which VCU offers licensure programs are as follows: English, history/social studies, mathematics and science (various specialities). Students should consult with their education adviser to ensure that courses taken to meet major requirements also meet state licensure requirements.

Change of major and transfer students

Students wishing to enter the Extended Teacher Preparation Program in early and elementary education or secondary education must transfer initially to the College of Humanities and Sciences. They must declare a major in the college and a specialization in the appropriate professional studies sequence in the School of Education. .

For admission to teacher preparation, a minimum GPA of 2.8 is required. A minimum GPA of 3.0 in the last 60 semester hours of study is required for admission to the graduate phase of the Extended Teacher Preparation Program.

Transcript evaluation

The College of Humanities and Sciences evaluates transcripts of students pursuing the extended program in early and elementary education or secondary education. Credits are accepted if they conform to specific program guidelines; course equivalents from accredited colleges and universities are accepted if the grade earned is a minimum of C. From the extended program, 60 semester hours of acceptable undergraduate course work are required to be admitted to a teacher preparation program. See specific criteria in the admission information below.

Credits that are accepted from two-year institutions may meet liberal arts and sciences requirements, but will not meet professional requirements for upper-division course work. The VCU Transfer Guide for Virginia Community Colleges lists, in full, credits accepted by VCU that have been earned in the state's community colleges.

After the initial student transcript evaluation, the assigned adviser reviews the accepted transfer credits with the student, determining what additional course work at VCU will be necessary. An adviser is not required to use all the accepted transfer credits in a student's program of study. Only those credits approved for transfer can be applied toward the chosen degree.

Faculty advisement

An academic adviser is assigned to a student by the department of that student's chosen major in the College of Humanities and Sciences. A professional studies adviser is similarly assigned by the Department of Teaching and Learning according to the student's proposed teaching endorsement. This adviser-student relationship continues throughout the course of study at VCU. Student and adviser jointly develop the student's individual program. During the planning process, the student identifies, clarifies and explores his or her personal and professional goals.

Educator as reflective practitioner

The guiding theme of the teacher preparation program is "educator as reflective practitioner." The underlying foundation of instruction in the teacher preparation program is to challenge the prospective teacher to develop skills in critical reflection and to value thoughtful decision-making. Candidates demonstrate critical reflection by: being open to and respectful of all stakeholders; taking other perspectives into account; utilizing critical--thinking in framing and solving educational problems; making informed, ethical and professional decisions; and taking ethical and professional action.

Demographics consideration in teaching

The demographics of elementary, middle and high school students are changing. There is an increase in the number of students for whom English is not the first language, of minority students, of students who do not all learn or respond in similar ways and of students who may be identified as possessing a disability.

Future teachers are encouraged to take advantage of opportunities through formal courses and other experiences to gain greater insight and ability in addressing learners from differing cultural backgrounds and considering the needs of learners with different learning styles, participation styles, and special abilities or disabilities.

Standards of learning

Much of the prekindergarten through grade 12 curriculum is based on the commonwealth of Virginia's current Standards of Learning. Students preparing to be teachers are advised to examine the SOLs for the grade levels and content areas they plan to teach. The School of Education website has a link to the SOLs.

In some instances the content and concepts associated with one or more SOLs may be incorporated in a course in the College of Humanities and Sciences or in the School of Education, but as the SOLs are for a kindergarten through grade 12 curriculum and not a college curriculum, one may need to study several of these on her or his own.

Technology standards

The use of computers, graphing calculators, science probeware and other technologies is integral to successful teaching in today's schools. Individuals preparing to teach must be competent on each of the eight standards in Virginia's Technology Standards for Instructional Personnel. These standards may be reached through the School of Education website.

Students are advised to consult with the professional studies adviser regarding the program's requirements for demonstrating competence. Several of the standards may be documented as met by passing the Computer Literacy Examination offered online through Knowledgenet. Please see the general education requirements for undergraduate study

(http://bulletin.vcu.edu/undergraduate/college-humanities-sciences/undergraduate-information) in the College of Humanities and Sciences section of this bulletin.

Extended program in early and elementary or secondary education

In the extended program, a student generally begins work on the professional studies component in the third year of study. Information on specific requirements for all academic majors is available in the Department of Teaching and Learning, in the College of Humanities and Sciences' associate dean's office or through the department of the chosen major. Students may visit soe.vcu.edu/academics_programs/teaching-and-learning (http://www.soe.vcu.edu/academics_programs/teaching-and-learning) for information about programs in the Department of Teaching and Learning. A student in the extended program must maintain a minimum cumulative GPA of 2.8 for admission to teacher preparation and clinical experience and, prior to the fifth year, a minimum GPA of 3.0 for admission to the graduate study portion of the program.

Admission information

Any undergraduate admitted to VCU who declares a major in the College of Humanities and Sciences is eligible to declare a specialization in special education or secondary education. Students specializing in early and elementary education must declare the liberal studies for early and elementary education major in the Bachelor of Interdisciplinary Studies program.

Transfer students and students currently attending VCU who wish to change their majors to this program must have a minimum GPA of 2.0; however, note the much higher GPA requirement for admission to teacher preparation and then to graduate study. All students in the program, upon completion of 60 hours of undergraduate course work and prior to completion of 90 hours, must apply for admission to teacher education. To be accepted, a student must have a minimum GPA of 2.8 and must have achieved the required commonwealth of Virginia scores on Praxis core tests and must have achieved the established score for the three tests.

Students who pursue one of the extended teacher preparation programs follow a series of steps as noted in order to meet all requirements, including the 153/154 credits.

Step 1: Admission to the university

Requirements

1. Scores from Scholastic Aptitude Test or American College Test
2. Minimum 2.0 GPA from high school or previous college

Procedures

1. Declare an undergraduate major in the College of Humanities and Sciences for early and elementary or secondary education.
2. Declare an education specialization in early and elementary education or secondary education.

Step 2: Admission to teacher preparation

Complete before enrolling in the first practicum (upon completion of 60 credits of liberal arts and prior to completion of 90 credits).

Requirements

1. Minimum GPA of 2.8
2. Completion of six hours of English, three hours of mathematics, four hours of laboratory science and six hours of social science and/or history
3. Meet Virginia scores required for the mathematics portion of Praxis and achieve a passing score on the Virginia Communication and Literacy Assessment
4. Confirmation of education specialization (Undecided majors must decide.)
5. Enroll in or have completed TEDU 101, EDUS 300, EDUS 301 or equivalent course

Procedures

1. Complete admission to teacher preparation application form (obtain in Office of Student Services) and submit a current transcript
2. Complete TEDU 101, EDUS 300, EDUS 301 or equivalent course; submit required Praxis scores
3. Register for practicum placement and accompanying courses. (**Note**: Students must be admitted to the teacher preparation program to be eligible for practicum placement and accompanying courses. Applications for practicum are available at the Student Services Center. In secondary education, these applications may be distributed at the initial class meeting.)
4. Register for, take and submit required Praxis core scores

Step 3: Application to graduate studies

Requirements

1. Minimum GPA of 3.0
2. Acceptable scores on the Graduate Record Examination or Miller Analogies Test [Generally students are expected to score at least a 290 composite (verbal and quantitative) on the GRE or 386 on the MAT.]
3. Personal statement addressing reasons for seeking graduate education, including career goals; experience working with age group to be taught; reasons for entering teaching; and success in organizing, planning and implementing work with other individuals
4. Three references: it is suggested that these be instructors or advisers in the College of Humanities and Sciences and the School of Education; use graduate studies reference forms

Procedures

1. Obtain Graduate School admissions packet from the Student Services Center in Room 1037, Oliver Hall
2. Return completed application packet, along with up-to-date transcripts, to the VCU Graduate School
   Note: Students must be admitted to the Graduate School to be eligible to enroll in graduate-level courses. No more than six graduate credits taken prior to admission to graduate study may be accepted toward the degree.

Application deadlines for early and elementary or secondary education

- Oct. 1 for spring semester
- Feb. 1 for summer and fall sessions

Step 4: Internship

All programs require a graduate-level internship
(TEDU 672 and TEDU 674) during the fifth year. Applications for internship can be obtained in the Student Services Center in Room 1037, Oliver Hall. Individuals in early and elementary education are placed in a kindergarten

and a grade one through six classroom in the same semester. Individuals in secondary education typically have a single placement, although perhaps with two different teachers.

Requirements

1. Minimum 3.0 GPA on graduate courses
2. Admission to teacher preparation and to graduate study
3. Completed application and transcripts submitted by established deadlines
4. Passing scores on applicable Praxis II specialty tests accompanying application
5. Passing scores on the Virginia Communication and Literacy Assessment

Procedures

1. Obtain application form from the Student Services Center
2. Submit copies of transcripts and required statement to a professional studies adviser for review
3. Obtain approval signature of professional studies adviser
4. Submit completed application to Student Services Center by Sept. 1 for the following spring semester, by Feb. 1 for the following fall semester

Step 5: Admission to the profession

(during the final semester of enrollment)

Requirements

1. Completion of all degree requirements
2. Completion of application for initial teacher licensure (obtain from Office of Student Services)

Procedures

1. Complete applications for undergraduate degree in humanities and sciences with academic major adviser, and graduate degree in teaching with professional studies adviser
2. Submit application for initial teacher licensure with signature of university supervisor or professional studies adviser to the Student Services Center

Added or add-on endorsements

Added or add-on endorsements Teaching English as a Second Language

The School of Education offers the Virginia Department of Education ESL preK-12 endorsement for pre-service and in-service teachers. The ESL endorsement program at VCU requires 18 credit hours of ESL course work and six credit hours of a modern foreign language. Candidates must complete the following courses:

Course	Title	Hours
ENGL/LING/TEDU 552	Teaching English as a Second Language	3
LING/ENGL/ANTH 390	Introduction to Linguistics	3
TEDU 561	Reading Foundations: Sociological/ Psychological Perspectives	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU/FRLG 575	Intercultural Communication	3
TEDU 681	Investigations and Trends in Teaching (ESL curriculum and assessment)	3
Foreign language courses (modern languages only)		6
Total Hours		24

Add-on endorsements in grades 6 through 12, science

Add-on endorsements in science are available in biology, chemistry, earth science and physics. Each add-on requires a first endorsement in one science and at least 18 semester hours in the add-on science that includes preparation in specified areas. The earth science added endorsement is listed below. For information about the added endorsements in biology, chemistry or physics, contact the Department of Teaching and Learning.

Earth science

To add an earth science endorsement to an endorsement in another science discipline, the individual must earn at least 18 semester hours in the earth sciences, including preparation in geology, oceanography, meteorology and astronomy. Courses to meet these requirements include:

Course	Title	Hours
ENVS 105 & ENVZ 105	Physical Geology and Physical Geology Laboratory	4
ENVS 335 & ENVZ 335	Environmental Geology and Environmental Geology Laboratory	4
ENVS 401	Meteorology and Climatology	3
ENVS 411	Oceanography	3
PHYS 103	Elementary Astronomy	3
Elective courses to complete at least 18 hours include: URSP 203 and URSP 204 and PHYS 391.		

Graduate information

Admission procedures for graduate study

Application procedures

Application forms and instructions for applying to all graduate programs are available on the Graduate School website (http://www.graduate.vcu.edu). Note that applications cannot be processed until they are complete (including test scores). Admission information specific to each program can be found in the department pages within this bulletin.

Test scores

Either the GRE, general aptitude portion, or the MAT is required for the Master of Teaching, the Master of Education, post-master's certificates, the post-baccalaureate Certificate in Teaching and the post-baccalaureate Certificate in Instructional Technology. The Ph.D. program requires the GRE. The Ed.D. in Leadership program requires the MAT.

A passing score on Praxis core, although not required for graduate admission, is required for placement in clinical experiences (practica, internships and certain externships) as well as for licensure in Virginia. Contact the Student Services Center (http://www.soe.vcu.edu/student-services-center) for applications for admission to teacher preparation and booklets on Praxis core and Praxis II. Information about the Praxis may

be obtained on the Praxis website at teacherstestprep.com/Praxis-Core. (http://www.teacherstestprep.com/Praxis-Core)

Application deadlines

The following application deadlines have been established for the Master of Education, the Master of Teaching and the post-baccalaureate Certificate in Teaching.

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Master's (various)	Summer or fall entry	Feb 1	See specific program
	Spring semester term of entry	Nov 1	

The Ph.D. in Education and Ed.D. in Leadership have the following application deadlines:

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Nov 15 (early consideration)	See specific program
		Jan 15 (final decision)	
Ed.D.	Summer	Feb 1	

Students who are unable to enroll for the semester for which they are accepted must request a deferment.

General admission requirements

The admission decision will be made on an overall analysis of the following for each degree program. See each program listing for any additional information.

Master of Teaching, Master of Education, post-master's Certificate in Educational Leadership, post-master's Certificate in Reading, post-baccalaureate graduate Certificate in Instructional Technology and post-baccalaureate graduate Certificate in Teaching

- A minimum GPA of 3.0 on a 4.0 scale on the last 60 semester hours of study: Applicants whose GPA during the last 60 hours of course work falls just below 3.0 may be considered based on the strength of the overall application.
- Acceptable scores on the GRE or the MAT: Normally, students are expected to score at least 290 combined on the quantitative and verbal sections of the GRE with neither score falling below the 20th percentile, or at least 386 on the MAT.
- An interview with the applicant may be required by the faculty of the program to which the applicant is seeking admission.

Ph.D. in Education and Ed.D. in Leadership

Refer to the program pages of this bulletin for concentration- or degree-specific admission requirements.

Advising and student program planning

The chart below outlines the general steps to completing the Master of Education programs. All other graduate-level students in the School of Education should refer to the appropriate section of this bulletin for information specific to these programs

Students are expected to work with their adviser to plan their programs of study. Each graduate program agreement, or changes thereto, must be approved by the adviser and the appropriate department chair. Courses taken without approval are taken at the student's risk. Each student is required to complete and file a program plan with the department before the completion of the sixth credit hour.

Steps to completing M.Ed. degree

Step	When	Where
1. Admission	0-6 hours	Office of Graduate Studies
2. Program of studies	0-6 hours	With adviser, approved by department chair
3. Candidacy	12-18 hours	Application approved by adviser, core coordinator, department chair
4. Comprehensive examination[1]	30 hours	Application to department office
5. Externship or internship	Usually the last semster of course work	Application from Student Services Center
6. Graduation	Last semester of course work; see deadlines on VCU academic calendar	Application approved by adviser, department chair and dean's office

[1]Not required in M.Ed. in Special Education and M.Ed. in Curriculum and Instruction

Admission to candidacy

Admission to graduate study in the Master of Education programs does not constitute candidacy for a degree. Rather, students who have been admitted to graduate study are advanced to degree candidacy upon the recommendation of the adviser, core faculty and department in which the degree is sought.

Advancement to degree candidacy requires that students must have completed at least 12 but no more than 18 semester hours of graduate study with a minimum GPA of 3.0; must have demonstrated clearly the aptitude and ability to pursue graduate study, including independent study; must have exhibited a commitment to their profession; and must have demonstrated promise for a successful career in the field selected with respect to temperament and personality. Specific courses may be required prior to application for candidacy. Admission to degree candidacy is not an automatic process. Students must file an approved application for candidacy with their departments. Only students who have been admitted to candidacy may pursue additional work toward the degree.

Comprehensive examination

- Some students in a Master of Education program must take a three-hour written comprehensive examination.
- Written examinations will be given on the first Saturday in November, the fourth Saturday in March and the second Saturday in July. Students must notify the department in writing of the intention to take the examination at least 30 days prior to the published date. All comprehensive examinations must be taken on dates indicated except for religious or health reasons. Any exceptions must be approved in advance by the department chair.

- A minimum of three faculty members, designated by the core faculty, will evaluate each examination independently. Satisfactory performance on the comprehensive examination requires approval of two of the three evaluators.
- Any student failing the comprehensive examination must have a joint conference with at least two core faculty members, one of whom is the student's adviser, before taking the comprehensive examination again.
- During the conference, the core faculty members may recommend additional academic preparation and/or competencies that must be met by the student prior to retaking the comprehensive examination.
- The student will be notified by letter of the recommendations made by the core faculty in the conference.

The student will have only two opportunities to take the comprehensive examination. Failure to pass the comprehensive examination the second time will result in the student being dropped from the degree program.

Transfer credit

A maximum of six credit hours of acceptable graduate credit may be transferred into a graduate degree program. Course work taken prior to being admitted to a program in the School of Education and not applied to another degree may be applied for transfer. This includes course work taken at VCU.

Course work submitted for transfer is evaluated by the student's adviser and the department head. See the Ph.D. in Education program section of this bulletin for information regarding transfer credit for this program.

As a general rule, continuing education courses taken at institutions other than VCU will not be transferred.

Students seeking to earn credit at other institutions after acceptance to a graduate program in the School of Education must receive prior approval from their advisers and the department chair or the director for the Ph.D. program. See the Graduate study (p. 33) section of this bulletin for further information regarding transfer credit.

Education, Doctor of Philosophy (Ph.D.) with a concentration in art education

Program goal

The art education concentration allows students to connect contemporary art and education theories and philosophies, practical and professional experiences, and impact research to develop an area of expertise relevant to the field of art education. The program distinguishes itself by integrating urban community engagement, digital and emerging media, and research and assessment in diverse settings. Graduates will be highly qualified to serve in teaching, research and leadership positions at universities and in arts and education organizations.

Student learning outcomes

1. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination.
2. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
3. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
4. Complete an original research study (dissertation component): Student will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once all members agree, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D in Education program, please see the doctoral student handbook. (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
ARTE 701	Issues in Art Education	3
ARTE 702	History of Art Education	3
ARTE 703	Contemporary Philosophies and Art Education	3
ARTE 704	Research in Art Education	3
ARTE 780	Cultural Diversity in Art and Society	3
ARTE 800	Advanced Seminar in Art Education	3
Elective from approved list		
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program coordinator
Sara Wilson McKay, Ph.D.
Chair, Department of Art Education, School of the Arts
Email: swilsonmckay@vcu.edu
Phone: (804) 828-7154

Additional contact
Colleen Thoma, Ph.D.
Professor and associate dean for academic affairs and graduate studies, School of Education
Email: cathoma@vcu.edu
Phone: (804) 828-3382

Program websites: soe.vcu.edu (http://www.soe.vcu.edu) and arts.vcu.edu/arteducation (http://arts.vcu.edu/arteducation)

Education, Doctor of Philosophy (Ph.D.) with a concentration in sport leadership

Program goal

The sport leadership concentration is designed for students to research, comprehend and interpret contemporary literature as it relates to leadership in the sport industry and to extend knowledge and understanding of leadership in that industry. Students will have the opportunity to integrate theory and practice in the specific areas

of economics, finance, marketing, management, communications and sociology of sport. Upon completion of the doctoral course work and dissertation, students will be prepared for higher education positions in sport management/administration and/or sport leadership programs across the U.S.

Student learning outcomes

1. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
2. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination. This exam is also graded "blindly," meaning that the evaluator does not know which student he or she is evaluating.
3. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
4. Complete an original research study (dissertation component): Students will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members approve, the student is granted a Ph.D.

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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Other information

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Ph.D.	Summer or fall	Dec 15	GRE

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2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
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EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
SCMA 643	Applied Multivariate Methods	3
SPTL 701	Seminar in Sport Research (repeated for three credits)	3
SPTL 702	Seminar in Sport Leadership and the Profession	3
SPTL elective		3
Doctoral course work in focus area [1]		6
Total Hours		48

[1] Universitywide electives to be selected in consultation with adviser

Total graduate credit hours required (minimum) 48

Graduate program coordinator
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Phone: (804) 828-6443

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Department of Counseling and Special Education

Donna Gibson, Ph.D.
Professor and chair

The Department of Counseling and Special Education blends top-tier, accredited programs in counselor education and special education and disability policy to create a unique, interdisciplinary academic environment for students and faculty. The department's primary mission is to prepare graduates to be leaders, ready to make a difference in people's lives. Courses emphasize applicable learning, incorporating the practical tasks and situations students will be faced with on the job.

The nationally recognized faculty members provide guidance and support, allowing students to fully explore their areas of interest. The department provides the tools that help students examine, refine and challenge current methods and scholarship and to use evidence-based research. Learn more by visiting the Department of Counseling and Special Education webpage (http://www.soe.vcu.edu/departmentpages/counseling-and-special-education).

- Counselor Education, Master of Education (M.Ed.) with a concentration in college student development and counseling (p. 518)
- Counselor Education, Master of Education (M.Ed.) with a concentration in school counseling
- Education, Doctor of Philosophy (Ph.D.) with a concentration in counselor education and supervision (p. 524)
- Education, Doctor of Philosophy (Ph.D.) with a concentration in special education and disability leadership (p. 525)
- Special Education, Master of Education (M.Ed.) with a concentration in early childhood (p. 527)
- Special Education, Master of Education (M.Ed.) with a concentration in general education
- Special Education, Master of Education (M.Ed.) with a concentration in severe disabilities

- Autism Spectrum Disorder, Certificate in (Post-baccalaureate graduate certificate) (p. 516)
- Disability Leadership, Certificate in (Post-baccalaureate graduate certificate) (p. 522)
- Special Education K-12 Teaching, Certificate in (Post-baccalaureate graduate certificate) (p. 533)

Autism Spectrum Disorder, Certificate in (Post-baccalaureate graduate certificate)

Note: Admission to this program is temporarily suspended.

Program goal

The post-baccalaureate graduate Certificate in Autism Spectrum Disorder is designed to prepare personnel to support individuals with autism spectrum disorder in the educational setting from early intervention through adult services. The purpose of the certificate is to provide the wide range of competencies necessary for the provision of effective educational programming. The course sequence enables personnel to develop comprehensive knowledge and experience in assessment, teaching strategies and curriculum development. The certificate is geared toward teachers, potential teachers and related service personnel. However, it is available to all professionals working in the human service setting who wish to gain expertise in this area.

All applicants must hold a bachelor's degree in any area related to education, social work, psychology or human services. Participants are required to earn 12 graduate credit hours as outlined below. Upon successful completion of the certificate program, participants will be able to:

1. Describe the primary and secondary characteristics of ASD and the impact on communication, socialization, sensory responses, patterns of behavior and learning style throughout the lifespan.
2. Understand the concerns of families of individuals with ASD and describe strategies and provide resources to help address these concerns.
3. Understand and apply theories and research that form the basis of curriculum development and instructional practice.
4. Assess student ability and develop individualized programs that use evidence-based practice to support and enhance learning across environments and across areas of development and need.
5. Describe the behavior of individuals with ASD in terms of its function and identify how to provide positive behavioral support in order to replace existing problem behavior or prevent the development of new problem behaviors.
6. Provide environmental supports, structure and technology adaptations to provide optimal learning and independence for individuals with ASD across environments.

The four autism spectrum disorder courses can also be completed by students who do not wish to earn the post-baccalaureate certificate. In this case, admission to the VCU Graduate School is not required. Individual student needs and preferences determine the best way for the student to proceed.

Student learning outcomes

1. Participants understand the field as an evolving and changing discipline based on philosophies, evidence-based principles and theories, relevant laws and policies, diverse and historical points of view, and human issues that have historically influenced and continue to influence the field of special education and the education and treatment of individuals with ASD. Participants understand how these influence professional practice, including assessment, instructional planning, implementation and program evaluation.
2. Participants understand the characteristics of those with ASD and the educational implications. This includes an understanding of:
   a. Primary and secondary characteristics of individuals with developmental disabilities/autism spectrum disorder
   b. Medical aspects and implications for learning for individuals with developmental disabilities/autism spectrum disorders
   c. Co-existing conditions and ranges that exist at a higher rate than in the general population
   d. Different ways of learning and the impact of academic and social abilities, attitudes, interests and values on instruction
3. Participants demonstrate knowledge of evidence-based practices selecting, adapting and using instructional strategies and materials according to characteristics of the individual with ASD. Participants demonstrate knowledge of evidence-based practices designed to target communication, social, behavior, sensory and academic needs.
4. Participants understand how to develop and implement comprehensive, longitudinal individualized programs in collaboration with team members. Participants demonstrate knowledge of instructional and assistive technology that can be integrated into the educational program. Participants understand how to plan systematic instruction based on learner characteristics, interests and ongoing assessment use.
5. Participants demonstrate knowledge of the components of assessment for individuals with developmental disabilities/autism spectrum disorder including both formal and informal assessments. Participants understand the need to assess individual strengths, skills and learning styles.
6. Participants understand the importance of collaboration with school personnel and families and demonstrate knowledge of related skills. Participants understand how to communicate effectively with families of individuals with ASD. Participants understand the value of observing, evaluating and providing feedback to paraeducators who work under their supervision.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Mar 15	
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline including education, social work, psychology or human services
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Note: Admission to this program is temporarily suspended.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 12 graduate credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
SEDP 532	Understanding Autism Spectrum Disorder	3
SEDP 634	Assessment, Curriculum and Teaching Methods for Autism Spectrum Disorder	3
SEDP 635	Supporting Behavior and Social Skills for Autism Spectrum Disorder	3
SEDP 638	Instructional Design and Field Experience for Autism Spectrum Disorder	3
Total Hours		12

Total graduate credit hours required (minimum) 12

Graduate program director
Selena J. Layden, Ph.D., BCBA-D, LBA
Department of Special Education and Disability Policy
Email: autisminfo@vcu.edu

Additional contact
James McMillan, Ph.D.
Professor and interim associate dean for academic affairs
Email: jhmcmill@vcu.edu
Phone: (804) 827-2620

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Counselor Education, Master of Education (M.Ed.) with a concentration in college student development and counseling

Program goal

The M.Ed. in Counselor Education with a concentration in college student development and counseling is a 48-credit-hour program designed to prepare counselors for higher education and community agencies throughout Virginia and the nation. The college student development and counseling concentration provides students with the specialized knowledge and skills necessary for employment as student affairs professionals in higher education settings. The program requires a minimum of two years of study to complete.

The faculty makes every effort to assist students in individualizing a graduate program to match their professional needs and interests. However, individualization takes place in an environment of legitimate constraints revolving around institutional, accreditation and licensure requirements. Faculty members view each program as more than simply an aggregate of courses, and students should plan all program work with their faculty advisers.

Student learning outcomes

Professional orientation/professional identity/ continuing education

1. Students display knowledge and understanding of the historical and philosophical foundations of the counseling profession, including counselor professional identity, and display necessary skills in applying this knowledge and understanding to professional practice.
2. Students demonstrate the ability to adhere to legal and ethical practice.
3. Students understand the importance of continuing education and are committed to seeking continuing education throughout their careers.

Helping relationships/group work/career development/wellness

1. Students display knowledge and understanding of counseling processes applied to both individuals and groups including knowledge of how to design, implement and evaluate programs related to academic, career and personal/social development of clients.
2. Students display knowledge and skills related to responding to crises, emergencies and disasters.
3. Students participate in the design, implementation and evaluation of programs that promote wellness, as well as prevention and intervention services.

Human development/wellness

Students display knowledge of theories of learning, personality development, transitions and resilience, and use this information as a basis for facilitating optimal development and wellness.

Social and cultural diversity/social justice and advocacy

1. Students display knowledge and understanding of diversity and equity issues and how these issues impact clients' academic, personal and career opportunities.
2. Students display multicultural competencies including appropriate sensitivity, skills and advocacy in working with diverse clients.
3. Students display knowledge and understanding of the relationship between counseling programs and academic achievement, including an understanding of factors that promote student success, and work to close the achievement gap among disenfranchised groups.

Assessment

Students display knowledge and understanding of multiple factors that may affect personal, social and academic functioning, and possesses knowledge and skills to identify, evaluate and implement appropriate needs assessments and consequent interventions.

Research

Students display knowledge and understanding of research and evaluation, including understanding of how data are used to inform decisions, and students display skills and professional practices in appropriate collection, analysis and use of data.

Leadership

1. Students display knowledge of issues that affect student affairs practice and demonstrate an understanding of leadership, organization and management practices that help institutions accomplish their missions.
2. Students advocate for policies, programs and services that are equitable and responsive to the unique needs of postsecondary students.
3. Students use and analyze multiple data sources, including institutional data, to make decisions about improving differentiated student programs and students develop measurable outcomes for student development activities.
4. Students collaborate with the postsecondary community to assist students and use postsecondary community resources to improve student learning and development.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students accepted into the counselor education program must make satisfactory progress toward their degrees. Students who earn unsatisfactory grades and/or exhibit unprofessional conduct may be terminated from the program. More specific information about satisfactory academic progress can be found on this website at satisfactory (p. 25)academic p (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/satisfactory-academic-progress)rogress (http://bulletin.vcu.edu/graduate/study/

general-academic-regulations-graduate-students/satisfactory-academic-progress).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Summer or fall	Dec 1 (early consideration)	GRE or MAT
		Jan 15 (final deadline)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Personal interview may be required
6. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Internship requirements: Students must complete approved internship.
4. Testing requirements: Students must provide acceptable score on the National Counselor Examination.

Curriculum requirements

Course	Title	Hours
Foundations		
Human development and learning		
CLED/EDUS 615	Lifespan Development: A Gender Perspective	3
Cultural, historical and philosophical		
EDUS/CLED 631	American College and University	3
Research		
EDUS 660	Research Methods in Education	3
Core courses		
CLED 600	Professional Orientation and Ethical Practice in Counseling	3
CLED 601	Theories of Counseling	3
CLED 602	Techniques of Counseling	3
CLED 603	Group Procedures in Counseling	3
CLED 605	Career Information and Exploration	3
CLED 606	Assessment Techniques for Counselors	3
CLED 607	Multicultural Counseling in Educational Settings	3
CLED 608	Practicum: College Student Development and Counseling	3
CLED 612	Seminar in Counseling	3
CLED 620	Student Development Services in Higher Education	3
CLED 672	Internship	6
Approved elective		3
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program coordinator
Philip B. Gnilka, Ph.D.
Assistant professor, Department of Counseling and Special Education
Email: pbgnilka@vcu.edu
Phone: (804) 828-1332

Additional contact
Donna Gibson, Ph.D.
Professor and chair, Department of Counseling and Special Education
Email: **dgibson7@vcu.edu**
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Counselor Education, Master of Education (M.Ed.) with a concentration in school counseling

Program goal

The M.Ed. in Counselor Education with a concentration in school counseling is a 48-credit-hour program designed to prepare counselors for elementary, middle and high schools. The school counseling concentration leads to school counseling licensure and preparation for advanced graduate work at the post-master's level. The program requires a minimum of two years of study to complete.

The faculty makes every effort to assist students in individualizing a graduate program to match their professional needs and interests. However, individualization takes place in an environment of legitimate constraints revolving around institutional, accreditation and licensure requirements. Faculty members view each program as more than simply an aggregate of courses, and students should plan all program work with their faculty advisers.

For students who already have a master's degree in education, the 36 credit hours of program core courses in the school counseling concentration also will lead to recommendation for licensure as a school counselor. Students who wish to gain this licensure must meet with the department chair and file a plan of study. Although students holding master's degrees do not apply for admission to the graduate program, they must file the appropriate plan of study in order to qualify for the VCU-approved program of study. No course work taken more than seven years prior to applying for licensure as a school counselor will count toward meeting VCU's approved program course equivalents.

Student learning outcomes

Professional orientation/professional identity/ continuing education

1. Students display knowledge and understanding of the historical and philosophical foundations of the counseling profession, including counselor professional identity, and display necessary skills in applying this knowledge and understanding to professional practice.
2. Students demonstrate the ability to adhere to legal and ethical practice.
3. Students understand the importance of continuing education and are committed to seeking continuing education throughout their careers.

Helping relationships/group work/career development/ wellness

1. Students display knowledge and understanding of counseling processes applied to both individuals and groups including knowledge of how to design, implement and evaluate programs related to academic, career and personal/social development of clients.
2. Students display knowledge and skills related to responding to crises, emergencies and disasters.
3. Students participate in the design, implementation and evaluation of programs that promote wellness, as well as prevention and intervention services.

Human development/wellness

Students display knowledge of theories of learning, personality development, transitions and resilience, and use this information as a basis for facilitating optimal development and wellness.

Social and cultural diversity/social justice and advocacy

1. Students display knowledge and understanding of diversity and equity issues and how these issues impact clients' academic, personal and career opportunities.
2. Students display multicultural competencies including appropriate sensitivity, skills and advocacy in working with diverse clients.
3. Students display knowledge and understanding of the relationship between counseling programs and academic achievement, including an understanding of factors that promote student success, and work to close the achievement gap among disenfranchised groups.

Assessment

Students display knowledge and understanding of multiple factors that may affect personal, social and academic functioning, and possesses knowledge and skills to identify, evaluate and implement appropriate needs assessments and consequent interventions.

Research

Students display knowledge and understanding of research and evaluation, including understanding of how data are used to inform decisions, and students display skills and professional practices in appropriate collection, analysis and use of data.

For school counseling concentration

1. Students display knowledge of the professional models that guide the practice of school counseling and demonstrate the ability to articulate, model and advocate for appropriate school counselor duties and programs.
2. Students display knowledge and understanding of the role of family-school-community collaboration on student development and strategies to enhance collaboration.

Leadership

Students display knowledge and understanding of leadership models and of the school counselor's role in school leadership; students display appropriate skills and dispositions for working in a leadership capacity in school counseling.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students accepted into the counselor education program must make satisfactory progress toward their degrees. Students who earn unsatisfactory grades and/or exhibit unprofessional conduct may be terminated from the program. More specific information about satisfactory academic progress (p. 25) can be found on this website.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Summer or fall	Dec 1 (early consideration)	GRE or MAT
		Jan 15 (final deadline)	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Personal interview may be required
6. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Internship requirements: Students must complete approved internship.
4. Testing requirements: Students must provide acceptable score on the National Counselor Examination.

Curriculum requirements

Course	Title	Hours
Foundations		
Human development and learning		
CLED/EDUS 615	Lifespan Development: A Gender Perspective	3
Cultural, historical and philosophical		
Select one of the following:		3
EDUS 601	Philosophy of Education	
EDUS 610	Social Foundations of Education	
EDUS 612	Education and the World's Future	
EDUS 614	Contemporary Educational Thought	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
Research		
EDUS 660	Research Methods in Education	3
Core courses		
CLED 600	Professional Orientation and Ethical Practice in Counseling	3
CLED 601	Theories of Counseling	3
CLED 602	Techniques of Counseling	3
CLED 603	Group Procedures in Counseling	3
CLED 604	Practicum: School Counseling	3
CLED 605	Career Information and Exploration	3
CLED 606	Assessment Techniques for Counselors	3
CLED 607	Multicultural Counseling in Educational Settings	3
CLED 612	Seminar in Counseling	3
CLED 613	Data-driven Comprehensive School Counseling Programs	3
CLED 622	School Counseling Services	3
CLED 672	Internship	6
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program coordinator
Philip Gnilka, Ph.D.
Assistant professor, Department of Counseling and Special Education
Email: pbgnilka@vcu.edu
Phone: (804) 828-1332

Additional contact
Donna Gibson, Ph.D.
Professor and chair, Department of Counseling and Special Education
Email: dgibson7@vcu.edu
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Disability Leadership, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The Certificate in Disability Leadership is a 12-hour certificate program designed to prepare health professionals, special educators and other professionals in related disciplines in the field of childhood neurodevelopmental disabilities to be leaders in the health care system. The program provides a 12- to 24-month curriculum of didactic and Web-based courses, interactive seminars, clinical and community-based practica, a family mentorship experience and planned grassroots- and systems-level policy activities. To be eligible for admission, a student must be accepted into the Virginia Leadership Education in Neurodevelopmental Disabilities program.

Va-LEND is a collaboration among the School of Education (Partnership for People with Disabilities), the VCU School of Medicine (Department of Pediatrics) and the Virginia Department of Health (Title V Program). The LEND curriculum emphasizes all aspects of neurodevelopmental and related disabilities, the social environment (including ethnic and cultural issues), the interdisciplinary approach (systems of care), leadership

(advocacy and public policy as well as administration) and research. Following completion of the program, the trainees will be able to serve as leaders in the field of child health and neurodevelopmental disabilities.

Student learning outcomes

1. Students will demonstrate an understanding of the nature and range of neurodevelopmental disabilities.
2. Students will demonstrate an understanding of the team approach to serving individuals with neurodevelopmental disabilities and their families.
3. Students will demonstrate an understanding of community services and resources available to individuals with neurodevelopmental disabilities and their families.
4. Students will demonstrate an understanding of their role as advocates for individuals with neurodevelopmental disabilities and their families.
5. Students will be involved in a leadership role with an organization serving individuals with neurodevelopmental disabilities and their families.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Mar 15	
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Completion of the Va-LEND application and submission to **Beth Bader** by June 1 to begin classes in the fall semester

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 12 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
IDDS 604	Interdisciplinary Studies in Developmental Disabilities: LEND Seminar I	4
IDDS 605	Interdisciplinary Studies in Developmental Disabilities: LEND Seminar II	4
IDDS 672	Practicum in Disability Leadership	4
Total Hours		12

Total graduate credit hours required (minimum) 12

Graduate program director

TBD

Additional contact
Beth A. Bader, Ph.D.
Associate director
Email: babader@vcu.edu
Phone: (804) 828-0073

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Education, Doctor of Philosophy (Ph.D.) with a concentration in counselor education and supervision

Program goal

The counselor education and supervision concentration is designed to prepare experienced, research-oriented master's-level counselors for academic positions focused on research, service, teaching and counselor education. Doctoral students will integrate theory, research and practice in areas of counselor supervision and training, counselor education and teaching, advanced counseling, diversity and multiculturalism, leadership, advocacy, and social justice.

Student learning outcomes

1. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination.
2. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
3. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
4. Complete an original research study (dissertation component): Students will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once all members agree, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

For additional information about the Ph.D. in Education program, please see the doctoral student handbook (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Nov 15 (preferred deadline)	GRE
		Dec 15 (final deadline)	

Special requirements

- Students wishing full consideration for graduate assistantships should apply by the early consideration deadline.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Master's degree from a CACREP-accredited program or related discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
CLED 720	Counselor Education Doctoral Seminar I	3
CLED 721	Counselor Education Doctoral Seminar II	3
CLED 730	Advanced Counseling Theories and Practicum	3
CLED 740	Supervision in Counseling	3
CLED 750	Advanced Group Counseling	3
CLED 760	Advanced Career Counseling and Development	3
CLED 810	Counselor Education Doctoral Internship	4
Total Hours		52

Total graduate credit hours required (minimum) 52

Graduate program coordinator
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Additional contact
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Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Education, Doctor of Philosophy (Ph.D.) with a concentration in special education and disability leadership

Program goal

The special education and disability leadership concentration is designed primarily for individuals employed in leadership positions in the field of special education. Emphasis in this concentration is placed on developing in-depth knowledge about topics as they pertain to personnel development, research, issues and policies in special education.

Student learning outcomes

1. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
2. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the

two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination. This exam is also graded "blindly," meaning that the evaluator does not know which student he or she is evaluating.

3. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
4. Complete an original research study (dissertation component): Students will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members approve, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D. in Education program, please see the doctoral student handbook (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship in teaching, research and service policy.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
SEDP 705	Seminar on Disability Policy	3
SEDP 706	Personnel Development in Special Education	3
SEDP 707	Critical Issues in Special Education	3
SEDP 708	Grant Writing in Special Education and Other Social Sciences	3
SEDP 709	Literature Reviews in Special Education and Other Social Sciences	3
Other courses selected in consultation with adviser		3
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program coordinator
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Additional contact
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Email: dgibson7@vcu.edu
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Special Education, Master of Education (M.Ed.) with a concentration in early childhood

Program goal

The Master of Education in Special Education program prepares graduates for work in one of three areas: early childhood, severe disabilities or general education. Applicants who do not already hold a teaching license must meet both licensure and degree requirements prior to the awarding of the Master of Education degree unless exempted as a professional from another discipline. Students should plan carefully with their adviser to ensure that the appropriate courses and experiences are completed. Successful completion of the degree program leads to endorsement in early childhood special education, special education-general education or severe disabilities.

The Master of Education in Special Education program with an early childhood concentration is a sequentially planned series of courses and clinical experiences designed to prepare individuals to work with young children, from birth through age 5, with developmental disabilities and their families. The courses are delivered using a hybrid of online and face-to-face formats. The program is learner-centered, innovative, interactive and collaborative. Through online discussions and face-to-face meetings with faculty members, community partners, student peers and program graduates, the ECSE teacher candidates have multiple opportunities to engage in interactive, proactive and dynamic dialogues.

Successful completion of the degree program qualifies students for teacher licensure with endorsement in early childhood special education by the Virginia Department of Education. Students are prepared to intervene with infants and young children representing a wide range of abilities, including those at risk for developmental delays. As a result of training, students will be prepared to serve children and families in diverse and high-need communities in a variety of early intervention roles. The program can be completed in five semesters of full-time study or six semesters of part-time study.

In addition to course work, candidates will create an electronic portfolio that will showcase their knowledge, skills and dispositions in the special education early childhood curriculum.

Student learning outcomes

1. Demonstrate content knowledge in special education: Candidates demonstrate content knowledge in special education as evidenced by the final portfolio and case-study paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan classroom-based instruction or activities for other roles as special educators as evidenced by the UDL/collaboration unit plan.
3. Effectively apply knowledge, skills and dispositions (clinical experience): Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation continuum.
4. Effect on student learning: Candidates demonstrate effects on student learning as evidenced by the unit plan with curriculum-based measure – secondary.
5. Candidates demonstrate CEC standards proficiency: Candidates further demonstrate proficiency on CEC competencies as evidenced by the assessing a child/IEP assignment, the multicultural poster and paper, and the functional behavior assessment/behavior intervention plan.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Mar 15	GRE or MAT
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 37 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
Select one of the following:		3
EDUS 605	Child and Adolescent Development	
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
EDUS 660	Research Methods in Education	3
Core courses		
ECSE 500	Language/Communication Intervention for Young Children with Disabilities	3
ECSE 542	Family/Professional Partnerships	2
SEDP 631	Behavior Support of Individuals with Disabilities	3
Concentration courses		
ECSE 541	Educational Foundations for Collaboration and Universally Designed Learning	3
ECSE 601	Assessment of Infants and Young Children with Disabilities	3
ECSE 602	Instructional Programming for Infants and Young Children with Disabilities	3
ECSE 603	Integrated Early Childhood Programs I	2
ECSE 604	Early Literacy and Augmentative Communication	3
ECSE 672	Internship in Early Development and Intervention	2
ECSE 700	Externship	4
SEDP 641	Independent Study	3
Total Hours		37

Total graduate credit hours required (minimum) 37

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Graduate program director
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Email: dgibson7@vcu.edu
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Special Education, Master of Education (M.Ed.) with a concentration in general education

Program goal

The Master of Education in Special Education program prepares graduates for work in one of three areas: early childhood, severe disabilities or general education. Applicants who do not already hold a teaching license must meet both licensure and degree requirements prior to the awarding of the Master of Education degree unless exempted as a professional from another discipline. Students should plan carefully with their adviser to ensure that the appropriate courses and experiences are completed. Successful completion of the degree program leads to endorsement in early childhood special education, severe disabilities or general curriculum.

The Master of Education in Special Education general education concentration, which can lead to an endorsement in the special education general curriculum, is designed to prepare graduates with the professional knowledge and skills needed to work in a variety of settings.

1. General education classrooms (where children with special needs are being collaboratively taught)
2. Resource, modified resource or collaborative resource rooms
3. Self-contained settings or classrooms in varied urban, suburban or rural areas
4. Residential programs
5. Various community environments

Special training is provided in teaching reading and language, behavior management, and the use of interactive strategies that teach positive social skills. Candidates are prepared to work with students in completing a variety of transitions, such as from special education to the general education classroom or from high school to employment and independent living.

Through course work, the general education concentration will encompasses broad concepts of education, research, development, related disciplines and special education to build a foundation of professional knowledge and understanding. Specialized courses develop the intensive diagnostic, remedial, decision-making and consultative skills and understandings required of a professional in a special education-general education setting, including the ability to recognize educational and social problems, to formulate effective individualized instructional interventions using a variety of methodologies and modifications, to incorporate accommodations and transitions into program plans and to consult productively with appropriate personnel in the development of maximum educational opportunities for students with high-incidence disabilities. In addition to course work, candidates will create an electronic portfolio that will showcase their knowledge, skills and dispositions in the special education general curriculum.

The program offers candidates the opportunity to complete clinical placements in their own classroom or school with approval from VCU faculty and supervision by trained personnel. Placement opportunities for clinical experiences include a range of public and private schools and mental health programs that allow graduate students to select field experiences that are consistent with their professional goals. Previous teaching experience is valued, but not required. Students will have the opportunity to complete a practicum in addition to the externship. When students complete the program, they are eligible for licensure by the Virginia Department of Education with an endorsement to teach students enrolled in special education, general curriculum in grades K-12. Candidates are offered the option of taking a full-time or an on-the-job externship for a semester.

Student learning outcomes

1. Demonstrate content knowledge in special education: Candidates demonstrate content knowledge in special education as evidenced by the final portfolio and case-study paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan classroom-based instruction or activities for other roles as special educators as evidenced by the UDL/collaboration unit plan.
3. Effectively apply knowledge, skills and dispositions (clinical experience): Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation continuum.
4. Effect on student learning: Candidates demonstrate effects on student learning as evidenced by the unit plan with curriculum-based measure – secondary.
5. Demonstrate CEC standards proficiency: Candidates further demonstrate proficiency on CEC competencies as evidenced by the assessing a child/IEP assignment, the multicultural poster and paper, and the functional behavior assessment/behavior intervention plan.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Nov 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Interview

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Applicants who do not have a provisional or professional collegiate teaching license in special education must take SEDP 630 as a prerequisite course.

Applicants who hold bachelor's degrees in areas other than special education must complete a review process with program faculty as part of the admissions process.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 37 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	3
Research		
EDUS 660	Research Methods in Education	3
Core courses		
SEDP 501	Characteristics of Individuals with Disabilities	3
SEDP 533	Assessment of Individuals with Disabilities	3
SEDP 601	Instructional Methods and Programming for Individuals with Disabilities	3
SEDP 603	Theories, Assessment and Practices in Literacy Development for Individuals with Exceptionalities	3 or 4
or TEDU 566	Diagnosis and Remediation in Reading	
SEDP 631	Behavior Support of Individuals with Disabilities	3
SEDP 531	Educational Foundations for Collaboration and Universally Designed Learning	3
SEDP 602	Methods II: Teaching Students in Special Education - General Education	2
SEDP 611	Secondary Education and Transition Planning	2
SEDP/TEDU 619	Multicultural Perspectives in Education	3
SEDP 700	Externship	3
TEDU 561	Reading Foundations: Sociological/Psychological Perspectives	3
Total Hours		37-38

Total graduate credit hours required (minimum) 37-38

Graduate program coordinator

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Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Special Education, Master of Education (M.Ed.) with a concentration in severe disabilities

Program goal

The Master of Education in Special Education program prepares graduates for work in one of three areas: early childhood, severe disabilities or general education. Applicants who do not already hold a teaching license must meet both licensure and degree requirements prior to the awarding of the Master of Education degree unless exempted as a professional from another discipline. Students should plan carefully with their adviser to ensure that the appropriate courses and experiences are completed.

The Master of Education in Special Education severe disabilities concentration is designed to prepare teachers to work with students in grades K-12 in public school settings. Throughout the program, emphasis is placed on person-centered planning, school and community inclusion, transdisciplinary teamwork and the role of the family. Successful completion of the degree program leads to licensure endorsement in special education, adapted curriculum K-12.

Courses address physical and medical management issues, functional assessment strategies, longitudinal curriculum planning, systematic instruction, augmentative and alternative communication systems, assistive technology, transition from school to adulthood, positive behavioral supports and the special needs of students with physical, sensory and health-related disabilities, including autism spectrum disorder.

All core courses are offered through the Virginia Consortium for Teacher Preparation in Special Education Adapted Curriculum: Supporting Students with Severe Disabilities and Autism. Core courses are accessed through VCU. Students enrolled in the program complete a field-based externship in their school (if they currently serve students with severe disabilities) or in one of the many public schools in the Richmond area. A total of six credit hours of externship experience is spread throughout the course of study and is designed to meet the students' needs for professional development.

All candidates are required to submit a final portfolio as the capstone requirement of the program. Successful completion of the 42-credit-hour program results in eligibility for Virginia endorsement in special education, adapted curriculum in addition to the Master of Education degree.

Student learning outcomes

1. Demonstrate content knowledge in special education: Candidates demonstrate content knowledge in special education as evidenced by the final portfolio and the disability case-study paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan classroom-based instruction or activities for other roles as special educators as evidenced by the intervention program plan with data.
3. Effectively apply knowledge, skills and dispositions (clinical experience): Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation continuum.
4. Effect on student learning: Candidates demonstrate effects on student learning as evidenced by the unit plan with the transition IEP.
5. Candidates demonstrate CEC standards proficiency: Candidates further demonstrate proficiency on CEC competencies as evidenced by the functional behavior assessment/behavior intervention plan, expanded present level of performance, low-tech device, teamwork project and physical management plan with assistive technology assignments.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Mar 15	GRE or MAT
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Applicants who do not have a provisional or professional collegiate teaching license in special education must take SEDP 630 as a prerequisite course.

Applicants who hold bachelor's degrees in areas other than special education must complete a review process with program faculty as part of the admissions process.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 42 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
Select one of the following:		3
EDUS 603	Seminar in Child Growth and Development	
EDUS 605	Child and Adolescent Development	
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
EDUS 660	Research Methods in Education	3
Concentration courses		
ECSE 700	Externship	6
IDDS 600	Interdisciplinary Studies in Developmental Disabilities: Teamwork in Serving Persons with Developmental Disabilities	3
SEDP 531	Educational Foundations for Collaboration and Universally Designed Learning	3
SEDP 600	Language/Communication Intervention for Young Children and Individuals with Severe Disabilities	3
SEDP 610	Teaching Strategies for Students with Severe Disabilities	3
SEDP 612	Assessment and Curriculum for Students with Severe Disabilities	3
SEDP 631	Behavior Support of Individuals with Disabilities	3
SEDP 632	Transition Strategies for Students with Disabilities	3
SEDP 651	Topics in Education (characteristics of students with severe disabilities)	3
SEDP 658	Educating Students with Physical and Sensory Disabilities	3
TEDU 561	Reading Foundations: Sociological/Psychological Perspectives	3
Successful completion of SEDP 630 if candidate does not hold eligibility for a Virginia provisional special education teaching license		
Successful completion of portfolio requirement		
Total Hours		42

Total graduate credit hours required (minimum) 42

Graduate program coordinator

Beth A. Bader, Ph.D.
Associate professor, Department of Counseling and Special Education
Email: babader@vcu.edu
Phone: (804) 828-1332

Additional Contact

Donna Gilles, Ed.D.
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Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Special Education K-12 Teaching, Certificate in (Post-baccalaureate graduate certificate)

The Certificate in Special Education K-12 Teaching will prepare provisionally licensed special education teachers to become fully licensed special education teachers who work with children with learning disabilities, emotional disturbance and mild to moderate intellectual disability. Students will be prepared to recognize a child's educational and social problems, to formulate effective individualized instruction, and to consult with parents, teachers and administrators to incorporate accommodations and transitions into the child's educational program. Graduates will be prepared to teach reading and language, behavior management, and social skills to students.

Student learning outcomes

Upon program completion, graduates will demonstrate the following knowledge and skills:

1. Apply evidence-based practices, professional knowledge and skills in inclusive classrooms with students with high-incidence disabilities
2. Design individualized assessments, unit and lesson plans, and make data-based decisions that will support the development of students with high-incidence disabilities
3. Integrate reading and language, behavior management, and the use of interactive strategies that teach social skills to students with high-incidence disabilities
4. Report and use formal and informal assessments techniques to deliver opportunities for students to transition into schools, programs and communities

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu. (http://www.graduate.admissions.vcu.edu)

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Aug 1	
	Spring	Nov 1	
	Summer	Mar 1	

Students applying for the special education K-12 teaching certificate must:

- Be employed by a Virginia public or nonpublic school as a special educator in special education-general curriculum K-12 and have the recommendation of the employing educational agency

Degree requirements

In addition to the VCU Graduate School graduation requirements (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements), students are required to complete all required course work.

1. Credit hour requirements: Students are required to complete a minimum of 27 credit hours.
2. Grade requirements: Courses that have not earned a minimum grade of C cannot be used to satisfy degree requirements. Students must maintain a minimum 3.0 GPA in order to meet satisfactory academic progress requirements and be eligible for financial aid.
3. Student teaching requirements: Students must successfully complete an approved student teaching experience.

Curriculum requirements

Course	Title	Hours
SEDP 501	Characteristics of Individuals with Disabilities	3

SEDP 502	Supervision Seminar I	1
SEDP 503	Supervision Seminar II	1
SEDP 531	Educational Foundations for Collaboration and Universally Designed Learning	3
SEDP 533	Assessment of Individuals with Disabilities	3
SEDP 601	Instructional Methods and Programming for Individuals with Disabilities	3
SEDP 602	Methods II: Teaching Students in Special Education - General Education	2
SEDP 603	Theories, Assessment and Practices in Literacy Development for Individuals with Exceptionalities	3
SEDP 611	Secondary Education and Transition Planning	2
SEDP 631	Behavior Support of Individuals with Disabilities	3
TEDU 561	Reading Foundations: Sociological/ Psychological Perspectives	3
Total Hours		27

Total graduate credit hours required (minimum) 27

Graduate program coordinator
LaRon Scott, Ed.D.
Assistant professor, Department of Counseling and Special Education
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Graduate program director
Donna Gibson, Ph.D.
Professor and chair, Department of Counseling and Special Education
Email: dgibson7@vcu.edu
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Department of Educational Leadership

Whitney S. Newcomb, Ph.D.
Professor and interim chair

The mission of the Department of Educational Leadership is to prepare school leaders who are able to translate authentic research on school leadership and society into quality practice.

The department offers two M.Ed. programs, a certificate program and two doctoral programs. The M.Ed. in Educational Leadership with a concentration in administration and supervision and the post-master's Certificate in Educational Leadership lead to endorsement in administration and supervision by the Virginia Department of Education. The M.Ed. in Educational Leadership with a concentration in leadership studies is offered for individuals in educational settings who want to study educational leadership but do not wish to seek endorsement in school administration and supervision.

The department offers an educational leadership concentration in the Ph.D. in Education, designed to prepare those who wish to focus on educational leadership, including careers as faculty members in higher education. The department oversees the Ed.D. in Leadership, a program for those wishing to study leadership and remain in leadership positions in educational organizations.

For more information consult the department's website. (http://www.soe.vcu.edu/departmentpages/educational-leadership)

- Education, Doctor of Philosophy (Ph.D.) with a concentration in educational leadership, policy and justice (p. 534)
- Educational Leadership, Master of Education (M.Ed.) with a concentration in administration and supervision (p. 537)
- Educational Leadership, Master of Education (M.Ed.) with a concentration in leadership studies (p. 539)
- Leadership, Doctor of Education (Ed.D.) (p. 540)
- Educational Leadership, Certificate in (Post-master's certificate) (p. 536)

Education, Doctor of Philosophy (Ph.D.) with a concentration in educational leadership, policy and justice

Program goal

The educational leadership, policy and justice concentration is designed to cultivate educational scholars and leaders who will advance scholarship, policy and practice related to equity and social justice. Drawing on an interdisciplinary study of leadership and policy, the program promotes an understanding of the many societal and organizational impediments to equal educational opportunity. This concentration is directed not only toward identifying and analyzing those injustices, but also toward imagining, researching and creating more equitable, inclusive schools and societies through leadership and policy. The dissertation is a rigorous culminating tool for research, advocacy and change within educational organizations and endeavors. Graduates will be prepared to lead for equity in K-12 organizations, higher education, research and policy think tanks or local, state and federal policymaking institutions.

Student learning outcomes

1. Complete an original research study: dissertation component – Student will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members agree, and other requirements are met, the student is granted a Ph.D.
2. Apply skills in external setting: externship component – Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
3. Develop research knowledge and skills: research component – Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by

at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination. This exam is also graded "blindly," meaning that the evaluator does not know which student he or she is evaluating.

4. Develop in-depth knowledge in one area of study: concentration component – Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

See the doctoral student handbook (http://bulletin.vcu.edu/graduate/school-education/educational-leadership/education-phd-concentration-educational-leadership/%20http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf) for further information.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3

Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
ADMS 703	Leadership for Social Justice and Equity in Education	3
ADMS 704	Education Finance Policy and the Equitable Distribution of Resources	3
ADMS 707	The Politics of Education	3
ADMS 708	Equal Educational Opportunity in the 21st Century Metropolis: Toward a Policy Framework	3
ADMS 709	U.S. Educational Policy	3
ADMS 710	Current Topics in Educational Leadership and Policy	3
Other courses selected in consultation with the adviser		
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program coordinator
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Additional contact
Whitney S. Newcomb, Ph.D.
Professor and interim chair, Department of Educational Leadership
Email: wsnewcomb@vcu.edu
Phone: (804) 828-8736

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Educational Leadership, Certificate in (Post-master's certificate)

Program goal

The post-master's certificate is a 21-hour program for individuals who have obtained a master's degree from a regionally accredited college or university; the degree must be in the field of education or in one that meets the requirements to be employed in a position requiring licensure in Virginia. Applicants must have an active five-year renewable educator license and have at least two years of experience in an instructional personnel position that requires licensure in Virginia.

Please visit the Department of Educational Leadership's website for additional information about program and application requirements.

Student learning outcomes

1. Candidates demonstrate content knowledge: Candidates demonstrate content knowledge in educational leadership as evidenced by the School Leaders Licensure Assessment and the school law case study.
2. Design, align, evaluate curriculum, guide learning: Candidates demonstrate the ability to develop a supervisory plan for classroom-based learning as evidenced by the clinical supervision model.
3. Internship/clinical practice: Candidates demonstrate effective applications in internship/clinical practice as evidenced by the on-site supervisor evaluation.
4. Assess application of content: Candidates demonstrate application of content as evidenced by the action research project.
5. Assess management and community relations: Candidates demonstrate organizational management and community relations skills as evidenced by the educational intervention plan.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 15	GRE or MAT

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Must hold a master's degree in the field of education or in one that meets the requirements to be employed in a position requiring licensure in Virginia
2. Must have an active five-year renewable educator license
3. Have at least two years of school experience in an instructional personnel position that requires licensure in Virginia
4. Three letters of recommendation addressing the student's potential for graduate study in education
5. Applicant's written statement concerning school leadership
6. Transcripts of all previous college work

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 21 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Testing requirements: Individuals must take the School Leaders Licensure Assessment or any other assessment required by the Virginia Board of Education for endorsement as a school principal/supervisor K-12.

Curriculum requirements

Course	Title	Hours
ADMS 611	School Law	3
ADMS 618	Leadership for Educational Change and Improvement	3
ADMS 625	Leadership for Individualized Learning	3
ADMS 627	Enhancing and Supporting Instruction	3
ADMS 633	Multiple Dimensions of Leadership	3
ADMS 640	Human Resource and Fiscal Management	3
ADMS 670	Administrative Internship I [1]	1
ADMS 671	Administrative Internship II [2]	1
ADMS 675	Administrative Internship III [3]	1
Assessment		
Individuals must take the SLLA or any other assessment required by the Virginia Board of Education for endorsement as a school principal/supervisor K-12. (no credit)		
Total Hours		21

[1] ADMS 670 must be taken in the first semester of enrollment in the program.

[2] ADMS 671 is taken in the next-to-last semester of enrollment in the program.

[3] ADMS 675 is taken in the last semester of enrollment in the program.

Total graduate credit hours required (minimum) 21

Additional contact
Whitney S. Newcomb, Ph.D
Professor and interim chair, Department of Educational Leadership
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Phone: (804) 828-8736

Program website: soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs (http://www.soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs)

Educational Leadership, Master of Education (M.Ed.) with a concentration in administration and supervision

Program goal

The administration and supervision concentration of the M.Ed. in Educational Leadership is a 33-credit-hour program that prepares individuals to fill positions as reflective leaders for schools. Applicants must possess an active five-year renewable educator license and are expected to have at least two years of experience in a school setting in an instructional personnel position that requires licensure in Virginia. An end-of-program assessment is required. Individuals must meet technology standards approved by the Virginia Board of Education, and they must supply proof of child abuse and neglect recognition training. Individuals who successfully complete the program are eligible for endorsement as an administrator/supervisor K-12.

Please visit the Department of Educational Leadership's website for additional information about program and application requirements.

Student learning outcomes

1. Content knowledge: Candidates demonstrate content knowledge in educational leadership as evidenced by the School Leaders Licensure Assessment and the school law case study.

2. Develop supervisory plan for learning: Candidates demonstrate the ability to develop a supervisory plan for classroom-based learning as evidenced by the clinical supervision model.
3. Internship/clinical practice: Candidates demonstrate effective applications in internship/clinical practice as evidenced by the on-site supervisor evaluation.
4. Assess ability to support student learning and development: Candidates demonstrate ability to support student learning and development as evidenced by the leadership to support student learning assessment.
5. Assess application of content: Candidates demonstrate application of content as evidenced by the action research project.
6. Assess management and community relations: Candidates demonstrate organizational management and community relations skills as evidenced by the educational intervention plan.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Applicant's written statement concerning school leadership
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT
6. At least two years of experience in a school setting in an instructional personnel position that requires licensure in Virginia

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Internship requirement: Students in the administration and supervision concentration must complete an internship sequence.
4. Testing requirements: Individuals must take the School Leaders Licensure Assessment or any other assessment required by the Virginia Board of Education for endorsement as a school principal/supervisor K-12.
5. For endorsement, individuals must meet the technology standards approved by the Virginia Board of Education, and they must supply proof of child abuse and neglect recognition training.

Curriculum requirements

Course	Title	Hours
Required courses		
ADMS 611	School Law	3
ADMS 618	Leadership for Educational Change and Improvement	3
ADMS 622	Understanding Diversity and Leading for Social Justice	3
ADMS 624	Principals as Human Resource Agents	3
ADMS 625	Leadership for Individualized Learning	3

ADMS 627	Enhancing and Supporting Instruction	3
ADMS 629	The Business of Schools	3
ADMS 630	Understanding and Engaging School Communities	3
ADMS 633	Multiple Dimensions of Leadership	3
ADMS 670	Administrative Internship I [1]	1
ADMS 671	Administrative Internship II [2]	1
ADMS 675	Administrative Internship III [3]	1
EDUS 660	Research Methods in Education	3
Assessment		
Individuals must take the SLLA or any other assessment required by the Virginia Board of Education for endorsement as a school principal/supervisor K-12. (no credit)		
Total Hours		33

1

ADMS 670 must be taken in the first semester of enrollment in the program.

2

ADMS 671 is taken in the next-to-last semester of enrollment in the program.

3

ADMS 675 is taken in the last semester of enrollment in the program.

Total graduate credit hours required (minimum) 33

Additional contact
Whitney S. Newcomb, Ph.D
Professor and interim chair, Department of Educational Leadership
Email: wsnewcomb@vcu.edu
Phone: (804) 828-8736

Program website: soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs (http://www.soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs)

Educational Leadership, Master of Education (M.Ed.) with a concentration in leadership studies

Program goal

The leadership studies concentration of the M.Ed. in Educational Leadership is a 30-credit-hour program for individuals who hold or expect to hold leadership positions in educational organizations but who do not wish to obtain the administration/supervision endorsement from the Virginia Department of Education. Applicants are expected to have at least two years of experience in an educational setting. The program includes 15 hours of credit in required courses and 15 hours in a concentrated series of electives chosen with approval of the student's adviser.

Student learning outcomes

1. Content knowledge: Candidates demonstrate content knowledge in educational leadership as evidenced by case study analyses.
2. Develop supervisory plan for learning: Candidates demonstrate the ability to develop a supervisory plan for classroom-based learning as evidenced by the clinical supervision model.
3. Assess ability to support student learning and development: Candidates demonstrate ability to support student learning and development as evidenced by the leadership to support student learning assessment.
4. Assess application of content: Candidates demonstrate application of content as evidenced by the action research project.
5. Assess management and community relations: Candidates demonstrate organizational management and community relations skills as evidenced by the educational intervention plan.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Applicant's written statement concerning leadership
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT
6. At least two years of experience in an educational setting

Please visit the Department of Educational Leadership's auto-advising webpage for program-specific application requirements.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 30 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Required courses		
ADMS 618	Leadership for Educational Change and Improvement	3
ADMS 622	Understanding Diversity and Leading for Social Justice	3
ADMS 630	Understanding and Engaging School Communities	3
ADMS 633	Multiple Dimensions of Leadership	3
EDUS 660	Research Methods in Education	3
Electives		
Any planned, concentrated series of courses from ADLT, ADMS, EDUS, PADM, SEDP and TEDU designed by student or student group and adviser to meet the needs of student or student group		15
Total Hours		30

Total graduate credit hours required (minimum) 30

Additional contact

Whitney S. Newcomb, Ph.D
Professor and interim chair, Department of Educational Leadership
Email: wsnewcomb@vcu.edu
Phone: (804) 828-8736

Program website: soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs (http://www.soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs)

Leadership, Doctor of Education (Ed.D.)

Program goal

The purpose of the Ed.D. in Leadership program is to engage leaders in a variety of learning organizations with practitioner-oriented knowledge and skills, authentic leadership and research experiences, and opportunities for reflection that will enable them to succeed in a variety of organizational leadership positions. Three analytic lenses (equity, accountability and learning theory) guide course work and enable students from diverse backgrounds to consider learning through common perspectives.

Students will examine cases centered on enduring questions in learning and leadership. Questions will be explored through contrasting evidence from a variety of perspectives and contexts.

Program features

The Ed.D. in Leadership is a 48-credit hour, 36-month program. Based upon principles of adult learning, the program has the following features:

1. Competitive admissions
2. Midcareer entry
3. Practitioner-oriented
4. Learning-community based
5. Problem-oriented andragogy and curriculum
6. Three learning communities: higher education administration, special education administration and general leadership (appropriate for administrators of schools, nonprofits and other learning enterprises)
7. Higher education administration and special education administration course work is all online, with periodic residencies (e.g. one weekend per semester and summer full-day institutes)
8. General leadership learning community is mostly face-to-face, but takes advantage of varied meeting formats (e.g. online, face-to-face, hybrid, weekday evenings, weekends, monthly and summer full-day institutes)
9. Program culminates in a three-semester applied group dissertation (the capstone)

Student learning outcomes

1. Confident and clear communication and presentation skills through formal benchmark presentations
2. Understanding and application of effective leadership, team-building and learning behaviors through team projects
3. Appropriate data-gathering, management and analysis techniques through program evaluation and capstone projects

4. Making of decisions and recommendations based upon data analysis and scholarly research through formal benchmark presentations and capstone projects
5. Scholarly writing skills through technical report writing
6. Academic achievement necessary to be considered for doctoral candidate status, as required by the university by meeting candidacy requirements

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ed.D.	Summer	Feb 1	MAT

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests and philosophy of leading for equity, accountability and learning environments
4. Transcripts of all previous college work
5. Professional vita or resume that addresses colleges or universities attended, educational degrees held, including major/minor, work history in chronological order, beginning with current position, leadership experiences, professional involvement, and awards and honors
6. Evidence of at least three years of successful leadership experience including evidence of leadership accomplishment for each of three areas:
   a. leadership for learning
   b. leadership for equity
   c. leadership for accountability
   (Applicants submit artifacts of evidence in the three areas through a website they develop.)
7. At least a 50th percentile score on the Miller Analogies Test

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48 credit hours.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program: Courses with a grade below C cannot be used to satisfy degree requirements.
3. Capstone requirements: Students must complete and defend a team-based capstone research project.

Curriculum requirements

Course	Title	Hours
EDLP 700	Effective Learning Networks	3
EDLP 702	Understanding Self as Leader: Theory and Data Analysis	2
EDLP 703	Understanding Self as Leader: Practical Applications	1
EDLP 704	Frameworks for Decision-making: Legal Perspectives	3
EDLP 705	Frameworks for Decision-making: Ethical Perspectives	3

EDLP 708	Leadership Presence	3
EDLP 709	Equity and Leadership	3
EDLP 711	Evidence-informed Perspectives on Practice I	3
EDLP 712	Planning for Sustainable Change I	3
EDLP 713	Evidence-informed Perspectives on Practice II	3
EDLP 714	Planning for Sustainable Change II	3
EDLP 715	Principles for Professional Writing I	3
EDLP 716	Principles for Professional Writing II	3
EDLP 717	Communicating Research Findings	3
EDLP 790	Capstone Development	3
EDLP 798	Capstone Plan Implementation	3
EDLP 799	Capstone Completion	3
Total Hours		48

Total graduate credit hours required (minimum) 48

Additional contact
Whitney S. Newcomb, Ph.D
Professor and interim chair, Department of Educational Leadership
Email: wsnewcomb@vcu.edu
Phone: (804) 828-8736

Program website: soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs (http://www.soe.vcu.edu/departmentpages/educational-leadership/educational-leadership-degreecertificate-programs)

Department of Foundations of Education

Maike Philipsen, Ph.D.
Professor and interim chair

The Department of Foundations of Education is committed to preparing educators and scholars for critical, reflective and responsible work in education, enhancing the knowledge base in the varied disciplines through research and scholarship, and engaging in service to the broader community.

To fulfill this mission, the department offers multidisciplinary perspectives that are the pillars for School of Education programs, based on the contention that the preparation of effective educational practitioners and scholars requires deep understanding of the broader perspectives that are represented by research and theory in psychological, cultural, philosophical, historical and ethical areas of inquiry. Learn more by visiting the Foundations of Education webpage (http://www.soe.vcu.edu/departmentpages/foundations-of-education).

- Education, Doctor of Philosophy (Ph.D.) with a concentration in educational psychology (p. 542)
- Education, Doctor of Philosophy (Ph.D.) with a concentration in research, assessment and evaluation (p. 544)

Education, Doctor of Philosophy (Ph.D.) with a concentration in educational psychology

Program goal

The educational psychology concentration is designed to train research-oriented doctoral students who want to promote the success of students in educational environments. Doctoral students will integrate theory and research in the areas of developmental psychology, cognition, social psychology and motivation, assessment, and diversity to better study learning in schools or school-like settings.

Student learning outcomes

1. Complete an original research study (dissertation component): Student will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once all members agree, the student is granted a Ph.D.; therefore, inter-rater reliability is extremely high.
2. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
3. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative, quantitative and mixed methods design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination. This exam is also graded "blindly," meaning that the evaluator does not know which student he or she is evaluating.
4. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D. in Education program, please see the doctoral student handbook (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Baccalaureate or master's degree in psychology, educational psychology or related discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Students admitted with only a baccalaureate degree are required to take an additional 15 credits of 600 level didactic courses in EDUS, PSYC, SEDP, TEDU or another subject, selected in consultation with an adviser.

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
EDUC 797	Directed Research	3
EDUS 620	Human Development in Education	3
EDUS 621	Motivation in Education	3
EDUS 662	Educational Measurement and Evaluation	3
EDUS 720	Seminar in Cognition and School Learning	3

EDUS 721	Advanced Seminar in Social Processes in Education	3
Elective selected in consultation with adviser		3
Total Hours		51

Total graduate credit hours required (minimum) 51

Graduate program coordinator
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Additional contact
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Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Education, Doctor of Philosophy (Ph.D.) with a concentration in research, assessment and evaluation

Program goal

The research, assessment and evaluation concentration is designed for individuals who want to develop skills to undertake, use and teach research, assessment and evaluation. Emphasis is placed on developing proficiency in quantitative, qualitative and mixed methods modes of inquiry and providing students with expertise to study varied educational and social research questions. Students select a focus in either research or evaluation.

Student learning outcomes

1. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
2. Develop research knowledge and skills (research component): Students will acquire the skills essential to designing, conducting and interpreting qualitative, quantitative and mixed-methods research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination.
3. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
4. Complete an original research study (dissertation component): Students will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members approve, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D. in Education program, please see the doctoral student handbook (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses [1]		
EDUS 661	Educational Evaluation: Models and Designs	3
EDUS 662	Educational Measurement and Evaluation	3
EDUS 712	Mixed Methods Research	3
PADM 627	Workshop in Policy Analysis and Evaluation	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
SOCY/PADM 605	Survey Research Methods	3
Total Hours		48

[1]

Students may select other courses in consultation with their adviser.

Total graduate credit hours required (minimum) 48

Graduate program coordinator
Lisa M. Abrams, Ph.D.
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Email: lmabrams@vcu.edu
Phone: (804) 828-1332

Additional contact
James McMillan, Ph.D.
Professor, Department of Foundations of Education
Email: jhmcmill@vcu.edu
Phone: (804) 828-1332

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Department of Teaching and Learning

Julie Gorlewski, Ph.D.
Associate professor and chair

The Department of Teaching and Learning is committed to excellence in the initial and continuing preparation of teachers for schools, government agencies, for-profit and nonprofit organizations, working with diverse groups; to modeling and encouraging critical reflection on practice; to collaborating and forming educational partnerships; to applying research and conducting scholarly endeavors that examine educational processes, issues and concerns; and to providing assistance and service to local, state, regional, national and international communities. Learn more by visiting the Department of Teaching and Learning webpage (http://www.soe.vcu.edu/academics_programs/teaching-and-learning).

- Adult Learning, Master of Education (M.Ed.) with a concentration in adult literacy (p. 546)
- Adult Learning, Master of Education (M.Ed.) with a concentration in human resource development (p. 548)
- Adult Learning, Master of Education (M.Ed.) with a concentration in teaching and learning with technology (p. 549)
- Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in instructional technology (p. 551)

- Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in online teaching (p. 552)
- Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in teaching and learning (p. 553)
- Education, Doctor of Philosophy (Ph.D.) with a concentration in curriculum, culture and change (p. 555)
- Education, Doctor of Philosophy (Ph.D.) with a concentration in urban services leadership (p. 556)
- Reading, Master of Education (p. 564)
- Reading, Master of Education (M.Ed.) with a concentration in K-12 reading specialist (p. 565)
- Reading, Master of Education (M.Ed.) with a concentration in TESOL/adult (p. 568)
- Reading, Master of Education (M.Ed.) with a concentration in TESOL/K-12 (p. 567)
- Teaching, Master of (M.T.) with a concentration in biology education (p. 580)
- Teaching, Master of (M.T.) with a concentration in chemistry education (p. 582)
- Teaching, Master of (M.T.) with a concentration in elementary education (p. 584)
- Teaching, Master of (M.T.) with a concentration in earth science education (p. 587)
- Teaching, Master of (M.T.) with a concentration in English education (p. 589)
- Teaching, Master of (M.T.) with a concentration in history/social studies education (p. 591)
- Teaching, Master of (M.T.) with a concentration in mathematics education (p. 593)
- Teaching, Master of (M.T.) with a concentration in physics education (p. 595)
- Teaching, Master of (M.T.) with a concentration in teaching health and physical education (p. 597)

- Instructional Technology, Certificate in (Post-baccalaureate graduate certificate) (p. 558)
- Medical Education, Certificate in (Post-baccalaureate graduate certificate) (p. 559)
- Online Teaching for K-12 Educators, Certificate in (Post-baccalaureate graduate certificate) (p. 561)
- Reading Specialist, Certificate in (Post-master's certificate) (p. 562)
- Teaching English to Speakers of Other Languages, Certificate in (Post-baccalaureate graduate certificate) (p. 570)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in biology education (p. 571)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in chemistry education (p. 573)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in English education (p. 574)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in history/social studies education (p. 576)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in mathematics education (p. 577)
- Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in physics education (p. 579)

Adult Learning, Master of Education (M.Ed.) with a concentration in adult literacy

Program goal

The Master of Education in Adult Learning is a 33-credit hour program of study that prepares individuals for a broad range of positions related to the education of adult learners. Students choose one of three elective concentrations in adult literacy, human resource development, or teaching and learning with technology. Graduates are found in major corporations, higher education, health care organizations, state and federal agencies, nonprofit and community-based organizations and human services agencies. Admission to the program is predicated on the "whole person" concept, taking into account life experience, academic record, references and the reasons for the student's interest in the program. An interview with the program adviser is recommended prior to admission. Successful applicants will have sufficient prior work experience with adults as learners to enable them to bring relevant work experience into the classroom learning environment.

The program provides a foundation in educational research methods and a strong core of seven courses in the theory and practice of adult learning, including emphasis in development of facilitation skills, as well as the design and delivery of adult learning programs. Upon completion of the foundation and core courses, students choose one of three concentration areas: adult literacy, human resource development (learning in the workplace), or teaching and learning with technology. The last course in the program, a capstone seminar in action learning, reunites students from all three concentrations for a comprehensive synthesis experience as they work in action learning teams to solve a real problem of strategic importance to an organization in the community.

A unique feature of the program is the learning portfolio, maintained in an online journal (blog) format. The learning portfolio, in combination with the capstone seminar, replaces a comprehensive examination requirement. For the portfolio, students write reflective blog entries during each of the core and concentration courses. During the program, selected assignments are posted to the blog to document personal growth and learning over time. At the end of the program, students create a synthesis of their learning in an essay format or through creation of a digital story. The portfolio serves as a demonstration of the graduate's abilities to a prospective employer and can be added to a student's resume. Throughout, the program utilizes students' experiences in working with adults as learners to unite theory with practice and emphasizes 21st-century technologies for teaching and learning.

Student learning outcomes

1. Demonstrate the ability to articulate a personal philosophy of adult learning practice that enables students to work effectively as leaders and facilitators to improve adult learning, as evidenced on the final program learning assessment
2. Demonstrate the ability to integrate knowledge of all facets of adult learning to have a significant impact on the practices, culture and learning environments of the organizations in which students work
3. Demonstrate knowledge of the nature, function and scope of adult learning during the capstone experience of the program
4. Demonstrate awareness of the processes of adult learning and development during the capstone experience

5. Acknowledge the influence of technology in adult learning, as evidenced in the final program learning assessment
6. Demonstrate awareness of educational research in the adult learning field, as evidenced on the research on instructional strategy and organizational change strategy analysis rubrics

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Nov 1	
	Summer	Feb 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

Students must meet all general VCU Graduate School graduation requirements (p. 31).

Curriculum requirements

Course	Title	Hours
Foundation course		
EDUS 660	Research Methods in Education	3
Core courses		
ADLT 601	Adult Learning and Development	3
ADLT 606	Design and Delivery of Adult Learning Programs	3
ADLT 610	Consulting Skills In Adult Learning Environments	3
ADLT 612	Learning in Groups and Teams	3
ADLT 636	Capstone Seminar in Action Learning	3
ADLT 650	Adult Literacy and Diversity	3
ADLT 688	Lifespan Issues for Adults with Learning and Behavioral Disabilities	3
Adult literacy concentration electives [1]		
READ 602	Literacy for Adults	3
TEDU/ENGL/LING 552	Teaching English as a Second Language	3
TEDU 681	Investigations and Trends in Teaching (issues in adult literacy)	3
Total Hours		33

1

Students choose an elective concentration of nine credit hours in adult literacy. These courses are designed to be taken after the student completes foundation and core courses, with the exception of ADLT 636, the capstone seminar.

Total graduate credit hours required (minimum) 33

Graduate program director
Robin R. Hurst, Ed.D.
Adult learning program coordinator
Email: rrhurst@vcu.edu
Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Adult Learning, Master of Education (M.Ed.) with a concentration in human resource development

Program goal

The Master of Education in Adult Learning is a 33-credit hour program of study that prepares individuals for a broad range of positions related to the education of adult learners. Students choose one of three elective concentrations in adult literacy, human resource development, or teaching and learning with technology. Graduates are found in major corporations, higher education, health care organizations, state and federal agencies, nonprofit and community-based organizations and human services agencies. Admission to the program is predicated on the "whole person" concept, taking into account life experience, academic record, references and the reasons for the student's interest in the program. An interview with the program adviser is recommended prior to admission. Successful applicants will have sufficient prior work experience with adults as learners to enable them to bring relevant work experience into the classroom learning environment.

The program provides a foundation in educational research methods and a strong core of seven courses in the theory and practice of adult learning, including emphasis in development of facilitation skills, as well as the design and delivery of adult learning programs. Upon completion of the foundation and core courses, students choose one of three concentration areas: adult literacy, human resource development (learning in the workplace), or teaching and learning with technology. The last course in the program, a capstone seminar in action learning, reunites students from all three concentrations for a comprehensive synthesis experience as they work in action learning teams to solve a real problem of strategic importance to an organization in the community.

A unique feature of the program is the learning portfolio, maintained in an online journal (blog) format. The learning portfolio, in combination with the capstone seminar, replaces a comprehensive examination requirement. For the portfolio, students write reflective blog entries during each of the core and concentration courses. During the program, selected assignments are posted to the blog to document personal growth and learning over time. At the end of the program, students create a synthesis of their learning in an essay format or through creation of a digital story. The portfolio serves as a demonstration of the graduate's abilities to a prospective employer and can be added to a student's resume. Throughout, the program utilizes students' experiences in working with adults as learners to unite theory with practice and emphasizes 21st-century technologies for teaching and learning.

Student learning outcomes

1. Demonstrate the ability to articulate a personal philosophy of adult learning practice that enables students to work effectively as leaders and facilitators to improve adult learning, as evidenced on the final program learning assessment
2. Demonstrate the ability to integrate knowledge of all facets of adult learning to have a significant impact on the practices, culture and learning environments of the organizations in which students work
3. Demonstrate knowledge of the nature, function and scope of adult learning during the capstone experience of the program
4. Demonstrate awareness of the processes of adult learning and development during the capstone experience
5. Acknowledge the influence of technology in adult learning, as evidenced in the final program learning assessment
6. Demonstrate awareness of educational research in the adult learning field, as evidenced on the research on instructional strategy and organizational change strategy analysis rubrics

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Nov 1	
	Summer	Feb 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

Students must meet all general VCU Graduate School graduation requirements (p. 31).

Curriculum requirements

Course	Title	Hours
Foundation course		
EDUS 660	Research Methods in Education	3
Core courses		
ADLT 601	Adult Learning and Development	3
ADLT 606	Design and Delivery of Adult Learning Programs	3
ADLT 610	Consulting Skills In Adult Learning Environments	3
ADLT 612	Learning in Groups and Teams	3
ADLT 636	Capstone Seminar in Action Learning	3
ADLT 650	Adult Literacy and Diversity	3
ADLT 688	Lifespan Issues for Adults with Learning and Behavioral Disabilities	3
Human resource development concentration electives [1]		
ADLT 620	Human Resource Development Overview	3
ADLT 623	Organizational Learning	3
ADLT 625	Change Strategies for HRD Practitioners	3
Total Hours		33

1

Students choose an elective concentration of nine credit hours in human resource development. These courses are designed to be taken after the student completes foundation and core courses, with the exception of ADLT 636, the capstone seminar.

Total graduate credit hours required (minimum) 33

Graduate program director
Robin R. Hurst, Ed.D.
Adult learning program coordinator
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Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Adult Learning, Master of Education (M.Ed.) with a concentration in teaching and learning with technology

Program goal

The Master of Education in Adult Learning is a 33-credit hour program of study that prepares individuals for a broad range of positions related to the education of adult learners. Students choose one of three elective concentrations in adult literacy, human resource development, or teaching and learning with technology. Graduates are found in major corporations, higher education, health care organizations, state and federal agencies, nonprofit and community-based organizations and human services agencies. Admission to the program is predicated on the “whole person” concept, taking into account life experience, academic record, references and the reasons for the student’s interest in the program. An interview with the program adviser is recommended prior to admission. Successful applicants will have sufficient prior work experience with adults as learners to enable them to bring relevant work experience into the classroom learning environment.

The program provides a foundation in educational research methods and a strong core of seven courses in the theory and practice of adult learning, including emphasis in development of facilitation skills, as well as the design and delivery of adult learning programs. Upon completion of the foundation and core courses, students choose one of three concentration areas: adult literacy, human resource development (learning in the workplace), or teaching and learning with technology. The last course in the program, a capstone seminar in action learning, reunites students from all three concentrations for a comprehensive synthesis experience as they work in action learning teams to solve a real problem of strategic importance to an organization in the community.

A unique feature of the program is the learning portfolio, maintained in an online journal (blog) format. The learning portfolio, in combination with the capstone seminar, replaces a comprehensive examination requirement. For the portfolio, students write reflective blog entries during each of the core and concentration courses. During the program, selected assignments are posted to the blog to document personal growth and learning over time. At the end of the program, students create a synthesis of their learning in an essay format or through creation of a digital story. The portfolio serves as a demonstration of the graduate’s abilities to a prospective employer and can be added to a student’s resume. Throughout, the program utilizes students’ experiences in working with adults as learners to unite theory with practice and emphasizes 21st-century technologies for teaching and learning.

Student learning outcomes

1. Demonstrate the ability to articulate a personal philosophy of adult learning practice that enables students to work effectively as leaders and facilitators to improve adult learning, as evidenced on the final program learning assessment
2. Demonstrate the ability to integrate knowledge of all facets of adult learning to have a significant impact on the practices, culture and learning environments of the organizations in which the student works
3. Demonstrate knowledge of the nature, function and scope of adult learning during the capstone experience of the program

4. Demonstrate awareness of the processes of adult learning and development during the capstone experience
5. Acknowledge the influence of technology in adult learning, as evidenced in the final program learning assessment
6. Demonstrate awareness of educational research in the adult learning field, as evidenced by the research on instructional strategy and organizational change strategy analysis rubric

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Nov 1	
	Summer	Feb 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

Students must meet all general VCU Graduate School graduation requirements (p. 31).

Curriculum requirements

Course	Title	Hours
Foundation course		
EDUS 660	Research Methods in Education	3
Core courses		
ADLT 601	Adult Learning and Development	3
ADLT 606	Design and Delivery of Adult Learning Programs	3
ADLT 610	Consulting Skills In Adult Learning Environments	3
ADLT 612	Learning in Groups and Teams	3
ADLT 636	Capstone Seminar in Action Learning	3
ADLT 650	Adult Literacy and Diversity	3
ADLT 688	Lifespan Issues for Adults with Learning and Behavioral Disabilities	3
Teaching and learning with technology concentration electives [1]		
ADLT 640	Theory and Practice of eLearning Integration Into Adult Learning Environments	3
ADLT 641	Exploration of Digital Media for Adult Learning	3
ADLT 642	Design Challenges in Creating eLearning for Adults	3
Total Hours		33

[1]

Students choose an elective concentration of nine credit hours in teaching and learning with technology. These courses are designed to be taken after the student completes foundation and core courses, with the exception of ADLT 636, the capstone seminar.

Total graduate credit hours required (minimum) 33

Graduate program director
Robin R. Hurst, Ed.D.
Adult learning program coordinator
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Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning

Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in instructional technology

Program goal

The Master of Education in Curriculum and Instruction program is designed to provide professional and cognate experiences for experienced educators seeking to develop additional skills in the use of technology in support of teaching and learning.

Student learning outcomes

1. Demonstrate an understanding of research designs and an ability to read research studies critically
2. Demonstrate an understanding of the historical, philosophical, sociological and ethical foundations of education and the impact that these have on public education
3. Demonstrate an understanding of the use of technology in support of student learning and the instructional process

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Three letters of recommendation addressing the student's potential for graduate study in education
2. Student's written statement concerning career interests
3. Transcripts of all previous college work
4. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
EDUS 660	Research Methods in Education	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Select one of the following:		3
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	

STAT/SOCY 508	Introduction to Social Statistics	
TEDU 615	Curriculum Development	
TEDU 617	Instructional Models and the Curriculum	
Other course as approved by adviser		
Core courses		
TEDU 556	Advanced Computer Applications in Education	3
TEDU 560	Instructional Strategies Using the Internet	3
TEDU 610	Developing and Critiquing Visual Literacy	3
TEDU 620/MASC 681	Video Applications in Instruction	3
TEDU 640	Designing and Managing eLearning	3
TEDU 673	Technology Leadership and Staff Development	3
Approved electives		
Any graduate courses with TEDU, EDUS or SEDP prefix		6
Other courses as approved by adviser		
Total Hours		33

Total graduate credit hours required (minimum) 33

Graduate program coordinator
Monty Jones, Ph.D.
Assistant professor, Department of Teaching and Learning
Email: joneswm2@vcu.edu
Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in online teaching

Program mission

The online teaching concentration of the Master of Education in Curriculum and Instruction is designed to prepare K-12 teachers and administrators to develop and facilitate effective online instruction in K-12 environments.

Program goals

1. Expand on participants' current teaching expertise in instructional strategies, curriculum design and assessment and evaluation to adapt to fully online and hybrid teaching environments
2. Foster the development of instructional leaders who can model and articulate best practices in online teaching within K-12 environments

Student learning outcomes

1. Demonstrate effective electronic communication methods for instruction in the K-12 environment
2. Reflect on current research and standards for online/blended course design/facilitation and articulate a personal philosophy of practice in these areas
3. Demonstrate effective virtual systematic instructional design though the development of a virtual learning environment
4. Demonstrate effective facilitation of virtual instruction including employment of techniques to encourage discussion, development of policies and procedures for digital communications and online conflict moderation, and use of effective virtual tools to improve learning
5. Demonstrate knowledge of effective strategies for assessment and evaluation in online environments through the development of rubrics and alternative assessment tools
6. Demonstrate knowledge of the TPACK framework in designing instruction with appropriate virtual tools
7. Demonstrate knowledge of online time and course management through the development of policies and procedures to assist online learners with these issues, and the development of appropriate materials that reflect effective time and course management by the course facilitator

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Three letters of recommendation addressing the student's potential for graduate study in education
2. Student's written statement concerning career interests
3. Transcripts of all previous college work
4. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
EDUS 660	Research Methods in Education	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Select one of the following:		3
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
STAT/SOCY 508	Introduction to Social Statistics	
TEDU 615	Curriculum Development	
TEDU 617	Instructional Models and the Curriculum	
Other course as approved by adviser		
Core courses		
TEDU 661	Current Topics in Virtual Teaching	1
TEDU 662	Foundations of Online Teaching	3
TEDU 663	Facilitating Digital Communication	3
TEDU 664	Instructional Design of Online Environments	2
TEDU 665	Assessment and Evaluation in Online Environments	1
TEDU 666	Content Focus Workshop	1
TEDU 667	Course Development Practicum	3
TEDU 668	Time and Course Management for Online Learning	1
TEDU 669	Online Course Facilitation Practicum	3
Approved electives		
Any graduate courses with TEDU, EDUS or SEDP prefix		6
Other courses as approved by adviser		
Total Hours		33

Total graduate credit hours required (minimum) 33

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, the nature of research being conducted by a student, or in the enrollment or funding status of the student. Students should refer to the program website and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program coordinator
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Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Curriculum and Instruction, Master of Education (M.Ed.) with a concentration in teaching and learning

Program goal

The Master of Education in Curriculum and Instruction program is designed to provide professional and cognate experiences for students who have been admitted to the Master of Teaching program but choose not to complete licensure. Enrollment in the teaching and learning concentration requires recommendation from the student's adviser and approval by the department chair. Content courses within the program are selected in consultation with an adviser.

Student learning outcomes

1. Demonstrate an understanding of research designs and an ability to read research studies critically
2. Demonstrate an understanding of the historical, philosophical, sociological and ethical foundations of education and the impact that these have on public education
3. Demonstrate an understanding of the use of technology in support of student learning and the instructional process

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Admission requirements

This concentration is intended for students who initially pursue a licensure program, but for whom that is no longer appropriate. Admission is by special action approved by the dean. Students may not apply directly to this concentration.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
Foundations		
EDUS 660	Research Methods in Education	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Select one of the following:		3
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
STAT/SOCY 508	Introduction to Social Statistics	
TEDU 615	Curriculum Development	
TEDU 617	Instructional Models and the Curriculum	
Other course as approved by adviser		
Core courses		
18 hours of graduate course work with TEDU, EDUS or SEDP prefix as approved by adviser		18
Approved electives		
Any graduate courses with TEDU, EDUS or SEDP prefix		6
Other courses as approved by adviser		
Total Hours		33

Total graduate credit hours required (minimum) 33

Graduate program coordinator
Julie Gorlewski, Ph.D.
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Email: jagorlewski@vcu.edu
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Additional contact
Colleen Thoma, Ph.D.
Professor and associate dean for academic affairs and graduate studies
Email: cathoma (cathoma@vcu.edu)@vcu.edu (jhmcmill@vcu.edu)
Phone: (804) 828-3382

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Education, Doctor of Philosophy (Ph.D.) with a concentration in curriculum, culture and change

Program goal

The curriculum, culture and change concentration offers a rigorous doctoral-level learning experience in curriculum and instruction with a strong emphasis on advocacy and social justice. The concentration prepares curriculum and instruction leaders for positions in school systems at the building level and above, as well as scholars with a wide range of curricular interests — urban education, rural education, linguistically diverse groups, oppressed groups, critical pedagogy, philosophical and sociocultural foundations of education, etc. In addition to a deep grounding in theoretical, practical and methodological approaches to curriculum and instruction, the concentration prepares instructional leaders to advocate for change across a wide range of institutions, systems and contexts. The concentration offers challenging learning experiences in the field of curriculum and instruction. Its expressed social justice values allow framing of courses in ways that provide critical analyses of contemporary schooling and ground students in the philosophical and historical roots of school change. The program welcomes students with interests in all institutional settings serving students across the life span (early childhood through adulthood) as well as informal and nonformal contexts. It also allows for discipline-specific cohorts in fields such as STEM and literacy.

The concentration distinguishes itself by preparing curriculum and instruction leaders to be change agents capable of working in school systems, higher education and advocacy organizations. It reflects an activist stance toward the education profession — one that views schooling as not only shaped by society but also as an active force for equity and meaningful societal change. It will appeal to a wide range of students: those who are seeking to become instructional leaders in school systems, those preparing to teach in the academy and all those desiring a strong foundation in educational reform.

Student learning outcomes

1. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination.
2. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
3. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
4. Complete an original research study (dissertation component): Student will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members agree, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D. in Education program, please see the doctoral student handbook. (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in curriculum and instruction, teaching and learning, educational philosophy or related discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests and goals
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
EDUS 706	Educational Theory and Praxis in Historical and Contemporary Contexts	3
EDUS 707	Socio-cultural Perspectives on Schooling, Society and Change	3
TEDU 617	Instructional Models and the Curriculum	3
TEDU 730	Professional Development for Changing Schools	3
TEDU 731	Instructional Theories and Strategies	3
TEDU 732	Advanced Seminar in Curriculum Studies	3
Electives chosen in consultation with adviser		6
Total Hours		54

Total graduate credit hours required (minimum) 54

Graduate program coordinator
Joan Rhodes, Ph.D.
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Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Education, Doctor of Philosophy (Ph.D.) with a concentration in urban services leadership

Program goal

The urban services leadership concentration is designed to prepare future researchers, faculty and practitioners for leadership roles in academic, government (local, state, national and international) and community based for-profit and non-profit organizations. Doctoral students will utilize a multidisciplinary approach to develop a broad understanding of the critical issues and challenges in adult learning and subsequently apply that understanding to the planning, implementation and evaluation of adult learning and educational programs and initiatives.

Applicants are expected to have experience working with adult learners in organizational, community, government, higher education, health care or nonprofit settings, or within the community in roles as faculty, faculty developers, trainers, human resource development and organizational development professionals, adult literacy educators, or other roles in

which they are actively involved in the teaching and training of adult learners.

Student learning outcomes

1. Apply skills in external setting (externship component): Students will demonstrate their knowledge and skills in a professional placement in a school, agency or corporate setting. The faculty adviser and the externship site supervisor work together to evaluate the student.
2. Develop research knowledge and skills (research component): Students will acquire the prerequisite skills essential to designing, conducting and interpreting qualitative and quantitative design research. Students will demonstrate this knowledge and skill set on a qualifying examination, which is independently evaluated by at least two faculty members. To address inter-rater reliability, if the two faculty members disagree on the student's level of knowledge, a third faculty member is called in to evaluate the student's responses on the qualifying examination.
3. Develop in-depth knowledge in one area of study (concentration component): Students will demonstrate in-depth knowledge and skills in an area of study that is congruent with their current or projected career goals. Content will differ according to chosen concentration.
4. Complete an original research study (dissertation component): Student will design, implement, analyze and defend an original research study. Once a student passes the prospectus hearing, he or she will collect and analyze the data and finish writing the last two chapters of their dissertation. Students have a committee of a minimum of four faculty members. Typically, this consists of a chair, a methodologist, a subject-matter expert and an expert outside of the School of Education. Each committee member independently reviews the student's work. Once the dissertation defense has occurred, the committee discusses their thoughts on the quality of the student work. Once members agree, the student is granted a Ph.D.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

For additional information about the Ph.D. in Education program, please seethe doctoral student handbook (http://www.soe.vcu.edu/files/2016/01/Ph.DHandbook2017.pdf).

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Summer or fall	Dec 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following represent the minimum requirements for admission:

1. Master's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. A personal interview and writing sample (may be requested)
6. Professional vitae/resume
7. Satisfactory scores on the GRE

Please see doctoral admissions information on the School of Education website for details.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 48-54 credit hours depending on concentration.

2. Grade requirements: Receipt of a grade of C or below in three courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Externship requirement: Students must complete an approved externship.
4. Examination requirements: Students must pass both a qualifying examination early in the program and a comprehensive examination near the end of the program.
5. Dissertation requirements: Students must complete and defend a research dissertation.

Curriculum requirements

Course	Title	Hours
Foundation		
EDUS 702	Foundations of Educational Research and Doctoral Scholarship I	3
EDUS 703	Foundations of Educational Research and Doctoral Scholarship II	3
Research		
EDUS 608	Educational Statistics	3
EDUS 710	Quantitative Research Design	3
EDUS 711	Qualitative Methods and Analysis	3
Research elective		3
Externship		
EDUC 700	Externship	3
Dissertation		
EDUC 899	Dissertation Research (minimum of six credit hours)	6
EDUS 890	Dissertation Seminar	3
Concentration courses		
Courses designed to prepare future researchers and practitioners for leadership roles in either adult learning or health promotion and education.		
ADLT 601	Adult Learning and Development	3
ADLT 702	Seminal Readings in Adult Learning Literature	3
Additional course work selected in consultation with the student's adviser.		12
Total Hours		48

Total graduate credit hours required (minimum) 48

Graduate program director
Robin R. Hurst, Ed.D.
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Additional contact
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Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Instructional Technology, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The post-baccalaureate Certificate in Instructional Technology prepares educators to use technology effectively in their schools and to provide instructional leadership and technical support to other educators who use computer technology. Designed for teachers, resource persons and administrators at all grade levels (K-12), the sequence in instructional technology offers a unique opportunity to develop comprehensive knowledge and experience in the educational applications of computers and related technologies. The primary purpose of this certificate program is to meet the growing need for highly qualified core curriculum teachers, instructional technology support teachers and associated administrative personnel. The program requires six three-credit-hour courses. In addition, prerequisites for the program require that students must be licensed K-12 teachers or administrators with a minimum of two years of classroom experience who have a basic knowledge of instructional media. The program is committed to providing access to technology so that hands-on experience is offered in every class and participants produce instructional material that can be immediately integrated into the classroom.

Student learning outcomes

1. Demonstrate the necessary knowledge and skills to facilitate effective learning experiences using technology
2. Demonstrate their skills in visual arts
3. Demonstrate successful searching techniques
4. Produce and edit video for education
5. Set up online instructional modules incorporating various communication and digital activities for students
6. Present at a conference and be able to prepare a professional development class in technology

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	
	Spring	Oct 1	
	Summer	Feb 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 18 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
TEDU 556	Advanced Computer Applications in Education	3
TEDU 560	Instructional Strategies Using the Internet	3
TEDU 610	Developing and Critiquing Visual Literacy	3
TEDU 620/MASC 681	Video Applications in Instruction	3
TEDU 640	Designing and Managing eLearning	3
TEDU 673	Technology Leadership and Staff Development	3
Total Hours		18

Total graduate credit hours required (minimum) 18

Graduate program director
Monty Jones, Ph.D.
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Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Medical Education, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The post-baccalaureate graduate Certificate in Medical Education is a 12-credit-hour program designed for faculty in the School of Medicine at Virginia Commonwealth University to enhance depth and breadth of faculty expertise in curriculum design and adult learning strategies for teaching, as well as to foster development of a cadre of academic leaders who can model best practices in teaching undergraduate, clinical and graduate programs.

Student learning outcomes

1. Demonstrate the ability to articulate a personal philosophy of practice that enables them to facilitate adult learning in medical education and engage in critically reflective practice as an educator
2. Demonstrate the ability to integrate knowledge of adult learning for teaching in medical education to function as educational leaders who model best practices and serve as role models for trainees
3. Demonstrate knowledge of assessment and evaluation strategies that align with goals and objectives and instructional strategies within a curriculum
4. Adopt one or more instructional methods for actively engaging learners in a discovery or inquiry process that incorporates small-group or team-based learning strategies
5. Demonstrate familiarity with a variety of digital media technologies appropriate for use in preclinical and clinical teaching situations
6. Become familiar with the scholarship of teaching and learning by developing a research agenda for inquiry into student and trainee learning to advance the practice of teaching in medicine by making research findings public

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 12 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.

Curriculum requirements

Course	Title	Hours
ADLT 670	Curriculum Design in Medical Education	2
ADLT 671	Theory and Practice of Adult Learning for Medical Educators	2
ADLT 672	Instructional Strategies for Teaching in Medicine	2
ADLT 673	Teaching as Scholarship in Medical Education	2
Electives		
Select two of the following:		4
ADLT 674	Performance Feedback and Simulation in the Medical Education Curriculum	
ADLT 675	Group and Team Facilitation for Medical Educators	
ADLT 676	Digital Media Technologies for Teaching in Medicine	
ADLT 677	Reflective Practice in Medical Education	
Total Hours		12

Total graduate credit hours required (minimum) 12

Graduate program coordinator
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Additional contacts
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Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Online Teaching for K-12 Educators, Certificate in (Post-baccalaureate graduate certificate)

Program goals

The post-baccalaureate graduate Certificate in Online Teaching for K-12 Educators is a 17-credit-hour certificate designed to prepare candidates to develop and facilitate effective online instruction in K-12 environments. The goals for the certificate are to:

1. Expand on participants' current teaching expertise in instructional strategies, curriculum design, and assessment and evaluation to adapt to fully online and hybrid teaching environments
2. Foster the development of instructional leaders who can model and articulate best practices in online teaching within K-12 environments

Student learning outcomes

1. Demonstrate effective electronic communication methods for instruction in the K-12 environment
2. Reflect on current research and standards for online/blended course design/facilitation and articulate a personal philosophy of practice in these areas
3. Demonstrate effective virtual systematic instructional design through the development of a virtual learning environment
4. Demonstrate effective facilitation of virtual instruction, including employment of techniques to encourage discussion, development of policies and procedures for digital communications and online conflict moderation, and use of effective virtual tools to improve learning
5. Demonstrate knowledge of effective strategies for assessment and evaluations in online environments through the development of rubrics and alternative assessment tools
6. Demonstrate knowledge of TPACK framework in designing instruction with appropriate virtual tools
7. Demonstrate knowledge of online time and course management through the development of policies and procedures to assist online learners with these issues and the development of appropriate materials that reflect effective time and course management by the course facilitator

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	
	Spring	Oct 1	
	Summer	Feb 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete a 21-month curriculum of online courses as well as course development and facilitation practica.

Curriculum requirements

Course	Title	Hours
TEDU 662	Foundations of Online Teaching	3
TEDU 663	Facilitating Digital Communication	3
TEDU 664	Instructional Design of Online Environments	2
TEDU 665	Assessment and Evaluation in Online Environments	1
TEDU 666	Content Focus Workshop	1
TEDU 667	Course Development Practicum	3
TEDU 668	Time and Course Management for Online Learning	1
TEDU 669	Online Course Facilitation Practicum	3
Total Hours		17

Total graduate credit hours required (minimum) 17

Graduate program coordinator
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Assistant professor, Department of Teaching and Learning
Email: joneswm2@vcu.edu
Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Reading Specialist, Certificate in (Post-master's certificate)

Program goal

The certificate program is designed for students who wish to gain state licensure as a reading specialist in kindergarten through high school settings. Applicants are required to have at least three years of teaching experience in a reading-related field setting if they want to be recommended to the Department of Education for endorsement as a reading specialist in Virginia.

All requirements for admission to graduate school apply to applicants for the Post-master's Certificate in Reading Specialist. All state department requirements for reading specialist (specifically the 12 hours of graduate or undergraduate work in selected areas) must be met.

Students are required to earn a minimum of 24 graduate hours beyond their current master's degree, including the required reading courses, an approved reading selective and an elective in the School of Education that has been approved by the adviser. Advisers will recommend selective courses based upon student experience and goals. During the last semester of course work, students must complete a reading portfolio documenting their work in the program and related work experiences. Candidates must receive a passing score on the Reading for Virginia Educators Assessment as a graduation requirement.

Persons completing the program are expected to demonstrate:

1. An understanding of the reading language learning process
2. The ability to critique, adapt and model use of a variety of reading instructional strategies, methods and programs
3. Expertise in developing and providing for continuous assessment of an individual and groups
4. Ability to implement schoolwide developmental, creative and intervention reading/language arts programs
5. Ability to understand and apply theory to practice within a variety of cultural contexts

Student learning outcomes

1. Demonstrate content knowledge in reading education: Candidates demonstrate content knowledge in reading education as evidenced by the Reading for Virginia Educators Assessment scores and the philosophy of reading paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan reading and literacy instruction, or fulfill other professional responsibilities in reading education as evidenced by the organizing and implementing reading programs assessment.
3. Effectively apply knowledge, skills and dispositions: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the internship evaluation.
4. Demonstrate effect on student learning: Candidates demonstrate effects on student learning and provision of supportive learning environments for student learning as evidenced by the internship progress report.
5. Demonstrate IRA standards proficiency: Candidates further demonstrate proficiency on IRA competencies as evidenced by the portfolio assessment and the externship action research report and presentation assessment.

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree

candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Must hold a master's degree in any specialty area related to education
2. Have active teacher license
3. Have at least three years of teaching experience in a reading-related setting
4. Three letters of recommendation addressing the student's potential for graduate study in education
5. Student's written statement concerning career interests
6. Transcripts of all previous college work
7. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 24 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Testing requirements: Students must provide a passing score on the Virginia Reading Assessment for graduation.
4. Endorsement requirements: Students must meet all Virginia Department of Education requirements to be recommended for endorsement.

Curriculum requirements

Course	Title	Hours
READ 600	Analysis and Correction of Reading Problems	3
READ 605	Organizing and Implementing Reading Programs	3
READ 672	Internship	3
READ 700	Externship	3
TEDU 561	Reading Foundations: Sociological/Psychological Perspectives [1]	3
TEDU 562	Reading Instruction in the Content Areas [1]	3
Approved literacy elective		
Select one of the following:		3
READ 601	Psycholinguistics and Language Arts Curriculum	
READ 602	Literacy for Adults	
TEDU 500	Workshop in Education (to be designated)	
TEDU 525	Teaching Language Arts	
TEDU 526	Word Study	
TEDU/ENGL 528	Children's Literature II	
TEDU 549	Diagnostic Reading in the Secondary School	
TEDU/ENGL/LING 552	Teaching English as a Second Language [1]	
TEDU 681	Investigations and Trends in Teaching	
Elective [2]		3
Total Hours		24

[1] These courses may also count as part of the ESL endorsement.

[2] Electives should be used to ensure state regulations for the endorsement are met.

Total graduate credit hours required (minimum) 24

Graduate program coordinator
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Additional contact
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Email: vjrobnolt@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Reading, Master of Education (M.Ed.)

Program goal

The Master of Education in Reading program is designed to provide experienced teachers who are prospective reading specialists with a program of sequential and integrated experiences in areas of the reading curriculum ranging from preschool to adult levels. Students will gain an understanding of the developmental and diagnostic processes involved in teaching reading and the language arts and will become familiar with the resource and supervisory functions that are part of the specialist role. Prior to graduation, students must complete a reading portfolio documenting their work in the program and related work experiences, and they must pass the Reading for Virginia Educators Assessment. The M.Ed. in Reading is an approved program (K-12) for students who meet Virginia State Department of Education requirements. The reading specialist endorsement also requires completion of three years of teaching in a reading-related field.

Student learning outcomes

1. Demonstrate content knowledge in reading education: Candidates demonstrate content knowledge in reading education as evidenced by the Reading for Virginia Educators/Virginia Reading Assessment scores and philosophy of reading paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan reading and literacy instruction or fulfill other professional responsibilities in reading education as evidenced by the organizing and implementing reading programs assessment.
3. Effectively apply knowledge, skills and dispositions: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the internship evaluation.
4. Demonstrate effect on student learning: Candidates demonstrate effects on student learning and provision of supportive learning environments for student learning as evidenced by the internship progress report.
5. Demonstrate IRA standards proficiency: Candidates further demonstrate proficiency on IRA competencies as evidenced by the portfolio assessment and the externship action research report and presentation assessment.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Mar 15	GRE or MAT
	Spring	Nov 1	
	Summer	Mar 15	

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants for the certificate program must hold a master's degree in any specialty area related to education.

A cooperative agreement has been established with Virginia State University to permit selected, qualified students to complete the M.Ed. in Reading program. Up to 12 credit hours from an approved list may be transferred from the cooperating institution. Interested students should contact the Department of Teaching and Learning.

Degree requirements

Students must meet all general VCU Graduate School graduation requirements (p. 31).

Curriculum requirements

Course	Title	Hours
Foundations		
Research		
EDUS 660	Research Methods in Education	3
Human development and learning		
Select one of the following:		3
EDUS 602	Adolescent Growth and Development	
EDUS 603	Seminar in Child Growth and Development	
EDUS 604	Adult Development	
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 609	Learning and Motivation in Education	
Cultural, historical and philosophical		
Select one of the following:		3
EDUS 601	Philosophy of Education	
EDUS 610	Social Foundations of Education	
EDUS 612	Education and the World's Future	
EDUS 614	Contemporary Educational Thought	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
Core courses		
READ 600	Analysis and Correction of Reading Problems	3
READ 605	Organizing and Implementing Reading Programs	3
READ 672	Internship	3
READ 700	Externship	3
TEDU 561	Reading Foundations: Sociological/Psychological Perspectives	3
TEDU 562	Reading Instruction in the Content Areas	3
Restricted electives		
Select two of the following: [1]		6
READ 601	Psycholinguistics and Language Arts Curriculum	
READ 602	Literacy for Adults	
TEDU 525	Teaching Language Arts	
TEDU 526	Word Study	
TEDU/ENGL 528	Children's Literature II	
TEDU 549	Diagnostic Reading in the Secondary School	
TEDU/ENGL/LING 552	Teaching English as a Second Language	
Total Hours		33

[1] Students' advisers may designate an alternate three-credit hour course elective as a substitute for one of the restricted electives.

Total graduate credit hours required (minimum) 33

Other curricular options

Endorsement in teaching English as a second language

Students who want to pursue an endorsement in teaching English as a second language may do so in conjunction with the M.Ed. in Reading. The endorsement requires 24 credit hours of study, none of which may be part of the master's degree if TEDU 552 is selected as the restricted elective. Nine additional hours of ESL course work and six hours of a modern foreign language are also required. For additional information, see the school's Added or add-on endorsements (p. 511) page in this bulletin or contact Valerie Robnolt, Ph.D. at vjrobnolt@vcu.edu.

Graduate program director
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Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://soe.vcu.edu)

Reading, Master of Education (M.Ed.) with a concentration in K-12 reading specialist

Program goal

The K-12 reading specialist concentration in the Master of Education in Reading program is designed to provide experienced teachers who are prospective reading specialists with a program of sequential and integrated experiences in areas of the reading curriculum ranging from preschool to adult levels. Students will gain an understanding of the developmental and diagnostic processes involved in teaching reading and the language arts and will become familiar with the resource and supervisory functions that are part of the specialist role. Prior to graduation, students must complete a reading portfolio documenting their work in the program and related work experiences and pass the Reading for Virginia Educators Assessment. The M.Ed. in Reading is an approved program (K-12) for students who meet Virginia State Department of Education requirements. The reading specialist endorsement also requires completion of three years of teaching in a reading-related field.

A cooperative agreement has been established with Virginia State University to permit selected, qualified students to complete the M.Ed. in Reading program. Up to 12 credit hours from an approved list may be transferred from the cooperating institution. Interested students should contact the Department of Teaching and Learning.

Student learning outcomes

1. Demonstrate content knowledge in reading education: Candidates demonstrate content knowledge in reading education as evidenced by the Reading for Virginia Educators Assessment scores and philosophy of reading paper.
2. Effectively plan instruction: Candidates demonstrate that they can effectively plan reading and literacy instruction or fulfill other

professional responsibilities in reading education as evidenced by the organizing and implementing reading programs assessment.
3. Effectively apply knowledge, skills and dispositions: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the internship evaluation.
4. Demonstrate effect on student learning: Candidates demonstrate effects on student learning and provision of supportive learning environments for student learning as evidenced by the internship progress report.
5. Demonstrate IRA standards proficiency: Candidates further demonstrate proficiency on IRA competencies as evidenced by the portfolio assessment and the externship action research report and presentation assessment.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Testing requirements: Students in the K-12 reading specialist concentration must present passing scores on state mandated licensure/endorsement assessments.

Curriculum requirements

Course	Title	Hours
Foundations		
Research		
EDUS 660	Research Methods in Education	3
Human development and learning		
Select one of the following:		3
EDUS 602	Adolescent Growth and Development	
EDUS 603	Seminar in Child Growth and Development	
EDUS 604	Adult Development	
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 609	Learning and Motivation in Education	
Cultural, historical and philosophical		
Select one of the following:		3

EDUS 601	Philosophy of Education	
EDUS 610	Social Foundations of Education	
EDUS 612	Education and the World's Future	
EDUS 614	Contemporary Educational Thought	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
Core courses		
READ 600	Analysis and Correction of Reading Problems	3
READ 605	Organizing and Implementing Reading Programs	3
READ 672	Internship	3
READ 700	Externship	3
TEDU 561	Reading Foundations: Sociological/ Psychological Perspectives	3
TEDU 562	Reading Instruction in the Content Areas	3
Restricted electives		
Select two of the following:		6
READ 601	Psycholinguistics and Language Arts Curriculum	
READ 602	Literacy for Adults	
TEDU 525	Teaching Language Arts	
TEDU 526	Word Study	
TEDU/ENGL 528	Children's Literature II	
TEDU 549	Diagnostic Reading in the Secondary School	
TEDU/ENGL/LING 552	Teaching English as a Second Language	
Total Hours		33

Total graduate credit hours required (minimum) 33

Graduate program coordinator
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Phone: (804) 828-1305

Additional contact
Valerie Robnolt, Ph.D.
Associate professor, Department of Teaching and Learning
Email: vjrobnolt@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Reading, Master of Education (M.Ed.) with a concentration in reading with TESOL/ K-12

Program goal

Students who already have their K-12 initial licensure and want to pursue an endorsement in teaching English as a second language in the K-12 setting may do so in the K-12 subconcentration of the TESOL concentration in the M.Ed. in Reading. The following are prerequisites to the concentration: LING 390/ENGL 390/ANTH 390 and six credit hours of foreign language. Students who pursue this concentration will **not** be endorsed as a K-12 reading specialist. Students interested in pursuing both endorsements must take the following nine credit hours in addition to the ones listed below: READ 600, READ 605 and READ 700.

Student learning outcomes

1. Demonstrate foundational knowledge need to support ELLs literacy learning
2. Effectively plan lessons that attends to linguistic proficiency of learners in various settings
3. Create assessments that assess ELL competency in communication and content learning
4. Demonstrate a disposition of tolerance and appreciation for linguistic and cultural diversity
5. Demonstrate a range of teaching strategies and approaches that lead to ELL learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Testing requirements: Students in the K-12 reading specialist concentration must present passing scores on state mandated licensure/endorsement assessments.

Curriculum requirements

Course	Title	Hours
Foundations		
Research		
EDUS 660	Research Methods in Education	3
Human development and learning		
Select one of the following:		3
EDUS 602	Adolescent Growth and Development	
EDUS 603	Seminar in Child Growth and Development	
EDUS 604	Adult Development	
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	
EDUS 609	Learning and Motivation in Education	
Cultural, historical and philosophical		
Select one of the following:		3
EDUS 601	Philosophy of Education	
EDUS 610	Social Foundations of Education	
EDUS 612	Education and the World's Future	
EDUS 614	Contemporary Educational Thought	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
Core courses		
ENGL/ENED 532	Applied English Linguistics	3
TEDU/ENGL/LING 552	Teaching English as a Second Language	3
TEDU 561	Reading Foundations: Sociological/Psychological Perspectives	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU/FRLG 575	Intercultural Communication	3
TEDU/LING 650	Second Language Acquisition	3
TEDU 675	Internship in ESL	3
TEDU 683	ESL Assessment and Trends	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Graduate program coordinator
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Graduate program director
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Reading, Master of Education (M.Ed.) with a concentration in reading with TESOL/adult

Program goal

Students who are interested in teaching English as a second language to adults may develop their knowledge and skills in the adult concentration of the TESOL track in the M.Ed. in Reading. Those who are interested in pursuing an endorsement in teaching English as a second language in the adult setting must already have their K-12 initial licensure and adult education endorsement. The following are prerequisites to the concentration: LING 390/ENGL 390/ANTH 390 and six credit hours of foreign language. Students who pursue this concentration will **not** be endorsed as a K-12 reading specialist.

Student learning outcomes

1. Demonstrate foundational knowledge needed to support ELLs literacy learning

2. Effectively plan lessons that attend to linguistic proficiency of learners in various settings
3. Create assessments that assess ELL competency in communication and content learning
4. Demonstrate a disposition of tolerance and appreciation for linguistic and cultural diversity
5. Demonstrate a range of teaching strategies and approaches that lead to ELL learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Ed.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Testing requirements: Students in the K-12 reading specialist concentration must present passing scores on state mandated licensure/endorsement assessments.

Curriculum requirements

Course	Title	Hours
Foundations		
Research		
EDUS 660	Research Methods in Education	3
Human development and learning		
ADLT 601	Adult Learning and Development	3
Cultural, historical and philosophical		
Select one of the following:		3
EDUS 601	Philosophy of Education	
EDUS 610	Social Foundations of Education	
EDUS 612	Education and the World's Future	
EDUS 614	Contemporary Educational Thought	
EDUS 673	Seminar on Educational Issues, Ethics and Policy	
Core courses		
ADLT 608	Adult Education Practicum	3
or TEDU 675	Internship in ESL	
ENGL/ENED 532	Applied English Linguistics	3
READ 602	Literacy for Adults	3

TEDU/ENGL/LING 552	Teaching English as a Second Language	3
TEDU 561	Reading Foundations: Sociological/ Psychological Perspectives	3
TEDU/FRLG 575	Intercultural Communication	3
TEDU/LING 650	Second Language Acquisition	3
TEDU 683	ESL Assessment and Trends	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Graduate program coordinator
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Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching English to Speakers of Other Languages, Certificate in (Post-baccalaureate graduate certificate)

Program goal

This program is designed to prepare professionals to work with K-12 students for whom English is not their native language. The course sequence meets the Virginia Department of Education requirements for endorsement in ESL. Note that endorsement requires that individuals have an active teaching license in Virginia.

Student learning outcomes

1. Demonstrate foundational knowledge needed to support ESL students' literacy learning
2. Effectively plan lessons that attend to linguistic proficiency of learners in various settings
3. Create assessments that assess ESL student competency in communication and content learning
4. Demonstrate a disposition of tolerance and appreciation for linguistic and cultural diversity
5. Demonstrate a range of teaching strategies and approaches that lead to ESL student learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree in an appropriate discipline including education, social work, psychology or human services
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work

Note: Endorsement requires a valid Virginia teaching license.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 18 credit hours.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Prerequisite or corequisite requirements: Students must have taken a class in linguistics and six hours of a modern foreign language.
4. Endorsement requires a valid Virginia teaching license.

Curriculum requirements

As prerequisites or corequisites to the certificate program, students must have taken a class in linguistics and have taken six credit hours of a modern foreign language. These courses are part of the endorsement requirements and may be taken at the undergraduate or graduate level. The certificate program consists of 18 credit hours of graduate course work as follows:

Course	Title	Hours
ENGL/LING/TEDU 552	Teaching English as a Second Language	3
TEDU 561	Reading Foundations: Sociological/ Psychological Perspectives	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU/FRLG 575	Intercultural Communication	3
TEDU 683	ESL Assessment and Trends	3
TEDU 675	Internship in ESL	3
Total Hours		18

Total graduate credit hours required (minimum) 18

Graduate program coordinator
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Additional contact
Julie Gorlewski, Ph.D.
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Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in biology education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority (applicants already may have earned a master's degree or wish to earn a master's degree in a specialized area of education later). Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
6. Measure student learning in ways that lead to sustained development and learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in biology
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 540)	1
Foundations		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

[1]

Program requirements consist of three undergraduate and 30 graduate credits.

Graduate program coordinator
Elizabeth Edmondson, Ph.D.
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Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in chemistry education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority. This program is for applicants who may already have earned a master's degree or wish to earn a master's degree in a specialized area of education later. Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
6. Measure student learning in ways that lead to sustained development and learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in chemistry
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration. Note that three credit hours are taken at the undergraduate level.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 540)	1
Foundations		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

[1]

Program requirements consist of three undergraduate and 30 graduate credits.

Graduate program coordinator
Elizabeth Edmondson, Ph.D.
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Additional contact
Julie Gorlewski, Ph.D.
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Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in English education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority. This program is for applicants who may already have earned a master's degree or wish to earn a master's degree in a specialized area of education later. Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
6. Measure student learning in ways that lead to sustained development and learning

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in English
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration. Note that three credit hours are taken at the undergraduate level.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 548)	1
Foundations		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 548	Teaching Secondary School English	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

[1]

Program requirements consist of three undergraduate and 30 graduate credits.

Graduate program coordinator
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Additional contact
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Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in history/social studies education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority (applicants already may have earned a master's degree or wish to earn a master's degree in a specialized area of education later). Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
6. Measure student learning in ways that lead to sustained development and learning

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in history, political science or related area
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests

4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration. Note that three credit hours are taken at the undergraduate level.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 547)	1
Foundations		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 547	Teaching Secondary School Social Studies	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

[1]

Program requirements consist of three undergraduate and 30 graduate credits.

Graduate program coordinator
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Additional contact
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Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in mathematics education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority. This program is for applicants who may already have earned a master's degree or wish to earn a master's degree in a specialized area of education later. Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in mathematics
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration. Note that three credit hours are taken at the undergraduate level.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 545)	1
Foundations		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 545	Teaching Secondary School Mathematics	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

[1]

Program requirements consist of three undergraduate and 30 graduate credits.

Graduate program coordinator
Elizabeth Edmondson, Ph.D.
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Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Certificate in (Post-baccalaureate graduate certificate) with a concentration in physics education

Program goal

The post-baccalaureate Certificate in Teaching program is designed for students who have earned bachelor's degrees in fields other than education, who wish to become teachers in secondary schools in one or more subjects and for whom a master's degree is not a priority. This program is for applicants who may already have earned a master's degree or wish to earn a master's degree in a specialized area of education later. Applicants must have a major or its equivalent in the subject they wish to teach.

Students are required to complete a minimum of 24 hours beyond the bachelor's level, including the courses listed below. Equivalent courses taken within the past five years may transfer; however, a minimum of 27 credit hours, including clinical experiences, must be taken at VCU after admission to the program.

Student learning outcomes

Persons completing the program are expected, among other attributes, to:

1. Understand human development and learning theory appropriate to the age group they will teach
2. Demonstrate knowledge of the subjects they will teach
3. Develop an understanding of purposes for education and a defensible philosophical approach toward teaching
4. Acquire awareness of the diversity of the school-age population in cultural background and styles of learning
5. Demonstrate an ability to plan and implement effective teaching
6. Measure student learning in ways that lead to sustained development and learning

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- Admission to clinical experiences in schools requires a background check and fingerprinting.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in physics
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

There are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33 credit hours depending on concentration. Note that three credit hours are taken at the undergraduate level.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Course	Title	Hours
Courses taken at the undergraduate level [1]		
TEDU 311	Middle School Practicum (taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (taken concurrently with TEDU 540)	1
Foundations		
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
Curriculum		
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
TEDU 681	Investigations and Trends in Teaching	3
Clinical		
TEDU 672	Internship	4
TEDU 674	Internship II	5
Total Hours		33

Total graduate credit hours required (minimum) 30 [1]

1

Program requirements consist of three undergraduate and 30 graduate credits.

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Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in biology education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Science education

1. Demonstrate content knowledge in science: Candidates demonstrate content knowledge in science as evidenced by the Praxis II scores.

2. Demonstrate conceptual content knowledge: Candidates demonstrate knowledge of the conceptual science to be taught and related fields, and that they are well-prepared in the breadth of knowledge needed to teach in their fields of licensure as evidenced by GPA in major courses.
3. Effectively plan classroom-based instruction: Candidates demonstrate the ability to plan effective classroom-based instruction and design assessments, consistent with the goals of the National Science Education Standards as evidenced by the unit plan assessment.
4. Effectively apply knowledge, skills and dispositions during student teaching: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation.
5. Demonstrate effects on student learning: Candidates demonstrate positive effects on student learning of major concepts, principles, theories, laws; the unifying concepts of science; the nature of science; the practice of inquiry (including student engagement in inquiry); analysis of issues related to science and technology; and the impact of science on themselves and their community as evidenced by the assessing student learning portion of the clinical evaluation.
6. Preparation for legal, ethical and safety issues: Candidates demonstrate preparation in legal issues, safety and ethical treatment of living things as evidenced by the safety module assessment.
7. Knowledge of research and investigation in science: Candidates demonstrate knowledge of research and investigation in science and understand multiple forms of scientific inquiry; can design, conduct and report research in their field; and can use mathematics and appropriate technology to collect, process and explain data as evidenced by the student-generated research assessment.
8. Knowledge of the contextual content of science: Candidates demonstrate knowledge of the contextual content of science and have a strong understanding of the socially relevant issues, social context, history, philosophy and applications of science as evidenced by the nature of science reflection assignment.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate science majors) including genetics/molecular biology, botany, zoology, anatomy/human physiology, ecology, two physics and one earth science		
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (science; must be taken concurrently with TEDU 540)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Elective		
Select one of the following:		3
EDUS 610	Social Foundations of Education	
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
TEDU 531	Media Literacy in the K-12 Classroom	
TEDU 619	Multicultural Perspectives in Education	
TEDU 651	Special Topics in Education (selected sections)	
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in chemistry education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and

Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Science education

1. Demonstrate content knowledge in science: Candidates demonstrate content knowledge in science as evidenced by the Praxis II scores.
2. Demonstrate conceptual content knowledge: Candidates demonstrate knowledge of the conceptual science to be taught and related fields, and that they are well-prepared in the breadth of knowledge needed to teach in their fields of licensure as evidenced by GPA in major courses.
3. Can effectively plan classroom-based instruction: Candidates demonstrate the ability to plan effective classroom-based instruction and design assessments, consistent with the goals of the National Science Education Standards as evidenced by the unit plan assessment.
4. Effectively apply knowledge, skills and dispositions during student teaching: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation.
5. Demonstrate effects on student learning: Candidates demonstrate positive effects on student learning of major concepts, principles, theories, laws; the unifying concepts of science; the nature of science; the practice of inquiry (including student engagement in inquiry); analysis of issues related to science and technology; and the impact of science on themselves and their community as evidenced by the assessing student learning portion of the clinical evaluation.
6. Preparation for legal, ethical and safety issues: Candidates demonstrate preparation in legal issues, safety and ethical treatment of living things as evidenced by the safety module assessment.
7. Knowledge of research and investigation in science: Candidates demonstrate knowledge of research and investigation in science and understand multiple forms of scientific inquiry; can design, conduct and report research in their field; and can use mathematics and appropriate technology to collect, process and explain data as evidenced by the student-generated research assessment.
8. Knowledge of the contextual content of science: Candidates demonstrate knowledge of the contextual content of science and have a strong understanding of the socially relevant issues, social context, history, philosophy and applications of science as evidenced by the nature of science reflection assignment.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and

licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate science majors) including genetics/molecular biology, botany, zoology, anatomy/human physiology, ecology, two physics and one earth science		
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (science; must be taken concurrently with TEDU 540)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Elective		
Select one of the following:		3
EDUS 610	Social Foundations of Education	
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
TEDU 531	Media Literacy in the K-12 Classroom	
TEDU 619	Multicultural Perspectives in Education	
TEDU 651	Special Topics in Education (selected sections)	
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in early and elementary education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Early and elementary education

Freshman students bound for the Master of Teaching program with a concentration in early and elementary education are required to enroll in the Bachelor of Interdisciplinary Studies with a liberal studies for early and elementary education major. This program offers liberal studies curriculum designed through an interdisciplinary collaboration among professors in the College of Humanities and Sciences and the School of Education in consultation with successful area teachers. It targets core knowledge across the four major subject areas represented in Virginia's

Standards of Learning (mathematics, sciences, social sciences and language arts/communication) while also providing a university-level skill set and knowledge base. Throughout the undergraduate program, contact with area schools and young learners is programmed into service and experiential learning venues.

Transfer students intending to be elementary teachers (and completing the Master of Teaching with a concentration in early and elementary education) are required to meet with advisers for the LSEE major prior to registering for courses. Advisers will evaluate all courses successfully completed outside of the LSEE major prescribed curriculum (from VCU or elsewhere) to determine their transferability to the LSEE major.

LSEE majors are encouraged to select at least one minor in order to deepen knowledge and appreciation of a subject area. Philosophy, religious studies, African American studies and international studies have relevance in their understanding of human investigation of knowledge, human behavior and world cultures. A minor in a science area such as environmental studies may be more employable because of school and societal concerns about our planet and its preservation. In selecting the humanities and sciences minor, the choice should be based on the student's interest and perceived relevance.

Consult with the appropriate professional studies adviser for additional information regarding professional studies and liberal arts requirements.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Early and elementary education

1. Master content knowledge: Candidates demonstrate content knowledge in the disciplines to be taught in an elementary classroom as evidenced by performance on Praxis II and the liberal arts equivalency GPA.
2. Demonstrate ability to plan instruction: Candidates demonstrate that they can effectively plan classroom-based instruction as evidenced by the read-aloud lesson plan.
3. Demonstrate application of knowledge, skills and dispositions: Candidates effectively use skills in practice as evidenced by the clinical evaluation continuum assessment during internship.
4. Demonstrate effect on student learning: Candidates demonstrate effect on student learning as evidenced by success on the practicum B lesson plans in math, science and social studies.
5. Demonstrate success on developmental project: Candidates will demonstrate competence in developing unit lesson plans as evidenced by the TEDU 414 unit plan.
6. Demonstrate success on activity project: Candidates will demonstrate competence in developing student activity plans by success on the health and PE movement experience activity project.
7. Demonstrate ability to integrate the arts in lessons: Candidates will demonstrate that they know, understand and use basic communication in the arts, can analyze art from structural, historical and cultural perspectives, and have an informed acquaintance with art from varied cultural and historical periods. Further, candidates will demonstrate that they are able to integrate art in a basic content lesson by success on the learning center notebook project.

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
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In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Program requirements – mathematics and statistical reasoning

The general education requirement is three to six credit hours; the early childhood/elementary education program requirement is six credit hours, including three credit hours in mathematics at the college algebra level or higher and three credit hours in a statistics course typically taught by a college department of mathematics. Choosing among these courses is recommended:

Course	Title	Hours
MATH 131	Introduction to Contemporary Mathematics	3
STAT 208	Statistical Thinking	3
STAT 210	Basic Practice of Statistics	3

Program requirements – natural sciences

The general education requirement is seven to nine credit hours, with one course each from the physical sciences and the biological sciences, with at least one laboratory; the early childhood/elementary education program requirement is 12 credit hours, again with at least one course each in the physical sciences and the biological sciences and two laboratories. Choosing among these courses is recommended:

Course	Title	Hours
Biological sciences		
BIOL 101 & BIOZ 101	Biological Concepts and Biological Concepts Laboratory	4
BIOL/ENVS 103	Environmental Science	4
Physical sciences		
CHEM 110 & CHEZ 110	Chemistry and Society and Chemistry and Society Laboratory	4
CHEM 112	Chemistry in the News	3
PHYS 101 & PHYZ 101	Foundations of Physics and Foundations of Physics Laboratory	4
PHYS 107	Wonders of Technology	4

Program requirements – applied arts

Two to three credit hours in applied arts to be designated with the professional studies adviser.

Professional studies requirements

Undergraduate courses

Course	Title	Hours
EDUS 301	Human Development and Learning	3
or PSYC 301	Child Psychology	
TEDU 310	Elementary School Practicum A (taken with TEDU 410, TEDU 414 and TEDU 426)	2
TEDU 313	Elementary School Practicum B (taken with TEDU 517, TEDU 522 and TEDU 591)	2
TEDU/ENGL 386	Children's Literature I	3
TEDU 390	Physical Education for the Elementary Teacher	3
TEDU 410	Classroom Management in Elementary Schools	3
TEDU 411	Integrating the Arts in Curriculum for Young Children [1]	2-3
or ARTE 301	Art for Elementary Teachers	
TEDU 414	Curriculum and Methods for Early/Elementary Children	4
TEDU 426	Teaching Reading and Other Language Arts	3
Total Hours		25-26

[1] Students may choose another applied arts course.

Graduate courses

Course	Title	Hours
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	3
TEDU 517	Science Education in the Elementary School	3
TEDU 522	Teaching Mathematics for Elementary Education	3
TEDU 566	Diagnosis and Remediation in Reading	4
TEDU 591	Social Studies Education in the Elementary School	3
TEDU 626	Home-School Communication and Collaboration	3
TEDU 672	Internship	4
TEDU 674	Internship II	4
TEDU 681	Investigations and Trends in Teaching	1
Total Hours		34

Total graduate credit hours required (minimum) 34

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Additional contact
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Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in earth science education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Science education

1. Demonstrate content knowledge in science: Candidates demonstrate content knowledge in science as evidenced by the Praxis II scores.
2. Demonstrate conceptual content knowledge: Candidates demonstrate knowledge of the conceptual science to be taught and related fields, and that they are well-prepared in the breadth of knowledge needed to teach in their fields of licensure as evidenced by GPA in major courses.
3. Effectively plan classroom-based instruction: Candidates demonstrate the ability to plan effective classroom-based instruction and design assessments, consistent with the goals of the National Science Education Standards as evidenced by the unit plan assessment.
4. Effectively apply knowledge, skills and dispositions: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice during student teaching, as evidenced by the clinical evaluation.
5. Demonstrate effects on student learning: Candidates demonstrate positive effects on student learning of major concepts, principles, theories, laws; the unifying concepts of science, the nature of science, the practice of inquiry (including student engagement in inquiry), analysis of issues related to science and technology, and the impact of science on themselves and their community as evidenced by the assessing student learning portion of the clinical evaluation.
6. Preparation for legal, ethical and safety issues: Candidates demonstrate preparation in legal issues, safety and ethical treatment of living things as evidenced by the safety module assessment.
7. Knowledge of research and investigation in science: Candidates demonstrate knowledge of research and investigation in science and understand multiple forms of scientific inquiry; can design, conduct and report research in their field; and can use mathematics and appropriate technology to collect, process and explain data as evidenced by the student-generated research assessment.
8. Knowledge of the contextual content of science: Candidates demonstrate knowledge of the contextual content of science and have a strong understanding of the socially relevant issues, social context, history, philosophy and applications of science as evidenced by the nature of science reflection assignment.

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate science majors) including genetics/molecular biology, botany, zoology, anatomy/human physiology, ecology, two physics and one earth science		
Admission to teacher preparation is a prerequisite for the following courses:		

TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (science; must be taken concurrently with TEDU 540)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Elective		
Select one of the following:		3
EDUS 610	Social Foundations of Education	
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
TEDU 531	Media Literacy in the K-12 Classroom	
TEDU 619	Multicultural Perspectives in Education	
TEDU 651	Special Topics in Education (selected sections)	
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in English education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

English education

1. Demonstrate content knowledge in the English: Candidates demonstrate content knowledge in the English language arts as evidenced by Praxis II scores and the undergraduate transcript analysis.
2. Demonstrate ability to plan instruction: Candidates demonstrate that they can effectively plan classroom-based instructions evidenced by the lesson plan assessment, lesson plan portion of the portfolio and the clinical evaluation continuum.
3. Demonstrate knowledge, skills and dispositions: Candidates demonstrate that knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation continuum assessment during internship.
4. Demonstrate effect on student learning: Candidates demonstrate effect on student learning as evidenced by success on the lesson plan portion of the portfolio.
5. Demonstrate NCTE standards proficiency: Candidates further demonstrate proficiency on NCTE competencies as evidenced by the dispositions assessment.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2

TEDU 312	High School Practicum (English; must be taken concurrently with TEDU 548)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
ENED/ENGL 601	Young Adult Literature	3
TEDU 537	Secondary School Curriculum	3
TEDU 548	Teaching Secondary School English (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in history/social studies education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

History/social studies education

1. Demonstrate content knowledge in social studies: Candidates demonstrate content knowledge in social studies as evidenced by the Praxis II scores and unit plan assessment in TEDU 547.
2. Effectively plan classroom-based instruction: Candidates demonstrate that they can effectively plan classroom-based instruction as evidenced by the lesson plan assessments in TEDU 547 and TEDU 681.
3. Effectively apply knowledge, skills and dispositions during student teaching: Candidates demonstrate that knowledge, skills and dispositions are applied effectively in practice as evidenced by clinical evaluations.
4. Demonstrate effects on student learning: Candidates demonstrate effects on student learning as evidenced by the portfolio: student work, reflections, case study and rubric for student teaching.
5. Candidates demonstrate National Council for the Social Studies standards proficiency: Candidates demonstrate proficiency on NCSS competencies as evidenced by the unit plan assessment in TEDU 547. This objective addresses NCATE Standard 1 – “Candidate Knowledge, Skills and Dispositions.”

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2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

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3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate history majors) in political science (12 credit hours), including six credit hours 100-level U.S. and international politics and six credit hours 300-level local and international politics; geography (nine credit hours), including three credit hours of physical geography and six credit hours of cultural geography; and economics (six credit hours), including macro- and microeconomics or (as undergraduate political science majors) in history (18 credit hours); geography (nine credit hours), including three credit hours of physical geography and six credit hours of cultural geography; and economics (six credit hours), including macro- and microeconomics		
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (history/social studies; must be taken concurrently with TEDU 547)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
TEDU 537	Secondary School Curriculum	3

TEDU 547	Teaching Secondary School Social Studies (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Elective		
Select one of the following:		3
EDUS 610	Social Foundations of Education	
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
SEDP 531	Educational Foundations for Collaboration and Universally Designed Learning	
SEDP 631	Behavior Support of Individuals with Disabilities	
TEDU 531	Media Literacy in the K-12 Classroom	
TEDU 556	Advanced Computer Applications in Education	
TEDU 627	Exploring Historical Consciousness	
TEDU 651	Special Topics in Education (selected sections)	
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

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Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in mathematics education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Mathematics education

1. Demonstrate content knowledge in mathematics: Candidates demonstrate content knowledge in mathematics as evidenced by the Praxis II scores and undergraduate mathematics GPAs. This objective addresses NCATE Standard 1 – “Candidate Knowledge, Skills and Dispositions.”
2. Effectively plan classroom-based instruction: Candidates demonstrate that they can effectively plan classroom-based instruction as evidenced by the unit-lesson plans, student handouts, assessments and video tape portions of the portfolio assessment.
3. Effectively apply knowledge, skills and dispositions during student teaching: Candidates demonstrate that knowledge, skills and dispositions are applied effectively in practice as evidenced by clinical evaluations.
4. Demonstrate effects on student learning: Candidates demonstrate effects on student learning as evidenced by lesson plan portion of the portfolio assessment and the clinical evaluation continuum.
5. Demonstrate National Council of Teachers of Mathematics standards proficiency: Candidates further demonstrate proficiency on NCTM competencies as evidenced by the technology lesson plans and the problem-solving lesson plans.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate mathematics majors): Students should be enrolled in VCU's 41-credit-hour secondary mathematics teacher preparation concentration within the baccalaureate mathematics program or have completed a degree in mathematics from an accredited university as a prerequisite to the M.T. degree program.		
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (mathematics; must be taken concurrently with TEDU 545)	1

Graduate courses

Course	Title	Hours
Required courses		
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
TEDU 521	Teaching Mathematics for Middle Education	3

TEDU 537	Secondary School Curriculum	3
TEDU 545	Teaching Secondary School Mathematics (fall only)	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

Graduate program coordinator
Elizabeth Edmondson, Ph.D.
Instructor, Department of Teaching and Learning
Email: ewedmondson@vcu.edu
Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in physics education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, or secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics).

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Secondary education

The Master of Teaching program includes curricula that lead to endorsement in one of the following disciplines: biology, chemistry, drama, earth science, English, history/social studies, mathematics or physics.

In order to enroll in the program, students must apply and be accepted to both the Extended Teacher Preparation Program and the Graduate School. Admission information for the Extended Teacher Preparation Program (p. 508) is available in this bulletin.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Science education

1. Demonstrate content knowledge in science: Candidates demonstrate content knowledge in science as evidenced by the Praxis II scores.
2. Demonstrate conceptual content knowledge: Candidates demonstrate knowledge of the conceptual science to be taught and related fields, and that they are well-prepared in the breadth of knowledge needed to teach in their fields of licensure as evidenced by GPA in major courses.
3. Effectively plan classroom-based instruction: Candidates demonstrate the ability to plan effective classroom-based instruction and design assessments, consistent with goals of the National Science Education Standards as evidenced by the unit plan assessment.
4. Effectively apply knowledge, skills and dispositions during student teaching: Candidates demonstrate knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation.
5. Demonstrate effects on student learning: Candidates demonstrate positive effects on student learning of major concepts, principles, theories, laws; the unifying concepts of science; the nature of science; the practice of inquiry (including student engagement in inquiry); analysis of issues related to science and technology; and the impact of science on themselves and their community as evidenced by the assessing student learning portion of the clinical evaluation.
6. Preparation for legal, ethical and safety issues: Candidates demonstrate preparation in legal issues, safety and ethical treatment of living things as evidenced by the safety module assessment.
7. Knowledge of research and investigation in science: Candidates demonstrate knowledge of research and investigation in science and understand multiple forms of scientific inquiry; can design, conduct and report research in their field; and can use mathematics and appropriate technology to collect, process and explain data as evidenced by the student-generated research assessment.
8. Knowledge of the contextual content of science: Candidates demonstrate knowledge of the contextual content of science and have a strong understanding of the socially relevant issues, social context, history, philosophy and applications of science as evidenced by the nature of science reflection assignment.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

Undergraduate courses

Course	Title	Hours
Qualifying courses		
EDUS 301	Human Development and Learning	3
Major courses (as undergraduate science majors) including genetics/molecular biology, botany, zoology, anatomy/human physiology, ecology, two physics and one earth science		
Admission to teacher preparation is a prerequisite for the following courses:		
TEDU 311	Middle School Practicum (secondary; must be taken concurrently with TEDU 537)	2
TEDU 312	High School Practicum (science; must be taken concurrently with TEDU 540)	1

Graduate courses

Course	Title	Hours
Required courses		
TEDU 537	Secondary School Curriculum	3
TEDU 540	Teaching Middle and High School Sciences (fall only)	3
EDUS 617/PSYC 657	Advanced Educational Psychology for Secondary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3

TEDU 562	Reading Instruction in the Content Areas	3
TEDU 588	Classroom Management	3
Elective		
Select one of the following:		3
EDUS 610	Social Foundations of Education	
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	
TEDU 531	Media Literacy in the K-12 Classroom	
TEDU 619	Multicultural Perspectives in Education	
TEDU 651	Special Topics in Education (selected sections)	
Clinical experience (spring only)		
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching (must be taken concurrently with TEDU 672 and TEDU 674)	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

Graduate program coordinator
Elizabeth Edmondson, Ph.D.
Instructor, Department of Teaching and Learning
Email: ewedmondson@vcu.edu
Phone: (804) 828-1305

Additional contact
Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

Teaching, Master of (M.T.) with a concentration in teaching health and physical education

Program goal

The Master of Teaching curricula are designed to incorporate eligibility for initial teaching licensure in Virginia in early and elementary, secondary education (biology, chemistry, earth science, English, history, history and social studies, mathematics or physics) or health and physical education.

The approved curricula include undergraduate qualifying courses as well. Individuals pursuing the extended program are awarded undergraduate and graduate degrees simultaneously; baccalaureate degree recipients who meet the admission criteria also may pursue the Master of Teaching degree program, including the qualifying courses. The combined baccalaureate and Master of Teaching program requires a minimum of 153-154 hours, at least 33 of which must be at the graduate level.

Health and physical education

The Master of Teaching program with a concentration in teaching health and physical education provides advanced course work in the application of health and movement science principles to health and physical education pedagogy. Students seeking an M.T. with the teaching health and physical education concentration are required to complete the Bachelor of Science in Health, Physical Education and Exercise Science. Students with an undergraduate degree in health and physical education or related degrees are encouraged to meet with an adviser prior to applying to graduate school.

Student teaching requirements

All students pursuing a secondary education endorsement within the Master of Teaching program will student teach in the spring semester. To do so, students must take and pass the Virginia Communication and Literacy Assessment and their subject-specific Praxis II exams before the fall semester of the academic year in which they will student teach.

Student learning outcomes

Health and physical education

1. Demonstrate content knowledge in health and physical education: Candidates demonstrate content knowledge in health and physical education as evidenced by Praxis II scores and the undergraduate transcript analysis.
2. Demonstrate ability to plan instruction: Candidates demonstrate that they can effectively plan classroom-based instructions evidenced by the lesson plan assessment, lesson plan portion of the portfolio and the clinical evaluation continuum.
3. Demonstrate that knowledge, skills and dispositions are applied effectively in practice as evidenced by the clinical evaluation continuum assessment during internship.
4. Demonstrate effect on student learning: Candidates demonstrate effect on student learning as evidenced by success on the lesson plan portion of the portfolio.

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.T.	Fall	Feb 1	GRE or MAT
	Spring	Oct 1	
	Summer	Feb 1	

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. Bachelor's degree with a major, or equivalent, in the subject the student wishes to teach (for secondary) or an appropriate liberal arts major (for early/elementary) (Students in the five-year extended program must be pursuing an appropriate bachelor's degree.)
2. Three letters of recommendation addressing the student's potential for graduate study in education
3. Student's written statement concerning career interests
4. Transcripts of all previous college work
5. Satisfactory scores on the GRE or MAT

Additionally, there are several tests that students must pass for admission to teacher preparation, admission to student teaching and licensure in Virginia. Students should consult the Student Services Center (http://www.soe.vcu.edu/student-services-center) section on the School of Education website for current testing requirements.

Admission to clinical experiences in schools requires a background check and fingerprinting.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses.

1. Credit hour requirements: Students are required to complete a minimum of 33-34 credit hours depending on concentration.
2. Grade requirements: Receipt of a grade of C or below in two courses constitutes automatic dismissal from the program. Courses with a grade below C cannot be used to satisfy degree requirements.
3. Student teaching requirements: Students must successfully complete approved student teaching experience. Note: Students must complete all undergraduate courses before student teaching.
4. Additional testing requirement: Students must pass Praxis II, where applicable, for licensure.

Curriculum requirements

The undergraduate program requires a minimum of 120 credit hours. To view undergraduate requirements, please see the program page for B.S. in Health, Physical Education and Exercise Science with a concentration in exercise science.

Course	Title	Hours
EDUS/PSYC 607	Advanced Educational Psychology for Elementary Teachers	3
EDUS 673	Seminar on Educational Issues, Ethics and Policy	3
SEDP 505	Theory and Practice of Educating Individuals with Special Needs	3
TEDU 512	Teaching Elementary Health and Physical Education	3
TEDU 513	Teaching Health Education	3
TEDU 514	Teaching Physical Education	3
TEDU 562	Reading Instruction in the Content Areas	3
TEDU 672	Internship	4
TEDU 674	Internship II	5
TEDU 681	Investigations and Trends in Teaching	3
Total Hours		33

Total graduate credit hours required (minimum) 33

Other curricular options

Students who already possess a content major in a discipline appropriate for secondary education may pursue a post-baccalaureate certificate.

Additional contact

Julie Gorlewski, Ph.D.
Associate professor and chair, Department of Teaching and Learning
Email: jagorlewski@vcu.edu
Phone: (804) 828-1305

Program website: soe.vcu.edu (http://www.soe.vcu.edu)

L. DOUGLAS WILDER SCHOOL OF GOVERNMENT AND PUBLIC AFFAIRS

The L. Douglas Wilder School of Government and Public Affairs is a creative, interdisciplinary grouping of programs in the social sciences and professional arenas that provides students with the knowledge, skills and experience necessary for success in public service.

The Wilder School brings together faculty from multiple disciplines that share a common interest in public affairs. The faculty includes individuals with strong research and analytical skills and with substantive expertise in fields such as criminal justice, economics, homeland security, public administration, urban planning and community development. These faculty members are committed to producing cutting-edge research and public service that can bridge the gap between theory and practice and to providing high quality, innovative and nationally competitive degree programs for students.

To achieve this mission, the Wilder School actively fosters and promotes a wide range of endeavors, including the establishment of interdisciplinary undergraduate and graduate programs that develop close ties with other related university programs. The Wilder School is an intellectually exciting place committed to having a genuine impact on public policy and providing an intellectually stimulating education for future public affairs professionals who share in school's commitment.

Administration

923 West Franklin Street
Box 842028
Richmond, Virginia 23284-2028
Phone: (804) 828-2292
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Susan Gooden, Ph.D.
Professor and interim dean

Jill Gordon, Ph.D.
Associate professor and associate dean of faculty and academic affairs

Nicholas Garcia
Director of undergraduate studies

Denia A. Lee-Hing, Ed.D.
Director of graduate studies

Elsie Harper Anderson, Ph.D.
Associate professor and director of Ph.D. program

Amy Cook, Ph.D.
Associate professor and program chair, criminal justice program

Myung Jin, Ph.D.
Assistant professor and program chair, M.P.A. program

William V. Pelfrey, Ph.D.
Associate professor and program chair, homeland security and emergency preparedness program

Damian Pitt, Ph.D.
Associate professor and program chair, urban and regional studies program

Accreditation

Public administration (master's degree)

National Association of Schools of Public Affairs and Administration

Urban and regional planning (master's degree)

Planning Accreditation Board

Program offerings

The school offers a variety of educational opportunities. Students may pursue three undergraduate programs and an additional three minors. Graduate programs provide options for full-time students and for practicing professionals interested in enhancing their skills or engaging in graduate-level work on a part-time basis. Current graduate offerings include nationally recognized master's programs and seven graduate-level certificates, as well as a doctoral degree program. Wilder School programs include:

Baccalaureate degrees

Bachelor of Science in Criminal Justice
Bachelor of Arts in Homeland Security and Emergency Preparedness
Bachelor of Science in Urban and Regional Studies

Minors

Criminal justice
Homeland security and emergency preparedness
Urban and regional studies

Post-baccalaureate graduate certificates

Certificate in Criminal Justice
Certificate in Gender Violence Intervention
Certificate in Geographic Information Systems
Certificate in Homeland Security and Emergency Preparedness
Certificate in Nonprofit Management
Certificate in Public Management
Certificate in Sustainability Planning
Certificate in Urban Revitalization

Master's degrees

Master of Arts in Homeland Security and Emergency Preparedness
Master of Public Administration
Master of Science in Criminal Justice
Master of Urban and Regional Planning

Doctoral degree

Ph.D. in Public Policy and Administration

The school also offers two dual degree programs with the University of Richmond's T.C. Williams Law School. Through these programs students can simultaneously obtain a law degree (J.D.) and either the Master of Public Administration or the Master of Urban and Regional Planning.

Service-learning and internship opportunities

Shajuana Isom-Payne
Director of student success

The educational experience at the L. Douglas Wilder School of Government and Public Affairs extends far beyond the classroom. Many students take advantage of service-learning (http://www.wilder.vcu.edu/service/servicelearning) and internship (http://www.wilder.vcu.edu/service/intern) opportunities, gaining valuable work experience and enhancing their resumes as they contribute in meaningful ways to governmental departments and agencies, legislative offices, nonprofit institutions, community initiatives, and businesses throughout Richmond.

Exceptionally qualified graduate students in the criminal justice, homeland security and emergency preparedness, public administration, and urban and regional planning programs are selected to be Wilder Graduate Scholars (http://www.wilder.vcu.edu/service/scholars) who undertake yearlong placements in which they benefit from professional work experience and financial support.

At the Wilder School, service is a tradition that is supported and cultivated by a faculty that reflects a tremendous commitment to community-based research. Each semester, VCU faculty offer a diverse selection of credit-bearing service-learning courses that provide students with the privilege of developing hands-on experience within their academic fields while engaging in meaningful projects that benefit local communities.

Guidelines for internships are available on the Wilder School website at wilder.vcu.edu/service/intern/guidelines.html (http://www.wilder.vcu.edu/service/intern/guidelines.html).

Graduate information

Admission

Admission to programs of the L. Douglas Wilder School of Government and Public Affairs is available to qualified students on a rolling admissions basis. Since the demand for admission to some programs is high and space availability is limited, students are encouraged to apply well in advance of their proposed admission dates.

As outlined below, admission requirements vary by academic program. No application packet will be considered by the relevant program admissions committee until all the required materials have been submitted by the applicant.

Application forms and instructions for applying to all graduate programs are available on the Graduate School website (http://www.graduate.vcu.edu).

Admission to a master's program from the certificate programs

The graduate Certificate in Public Management and the graduate Certificate in Nonprofit Management are designed for persons in professional positions who require a limited number of courses in contemporary management theory and skills. However, if a student later decides to pursue the M.P.A. degree, successfully completed certificate courses may be applied toward the degree. Successful completion of either certificate does not guarantee admission into the M.P.A. degree program.

The courses in the post-baccalaureate Certificate in Criminal Justice program are the same as the master's courses and, with grades of B or better and upon acceptance into the master's degree program, are fully transferable to the Master of Science in Criminal Justice program.

All courses in the Certificate in Urban Revitalization may be applied to meet the requirement of the Master of Urban and Regional Planning degree. However, successful completion of the certificate program does not guarantee admission into the M.U.R.P. degree program.

Provisional admission

In rare cases, applicants who do not meet the requirements for full admission may be accepted provisionally upon recommendation of the program's admissions committee. The conditions for earning full admission are stated in the provisional acceptance letter sent by the dean of the Graduate School. Conditions usually include the requirement that the student complete the first nine hours of departmental graduate courses with a minimum grade of B in each course.

Provisional admission does not constitute a waiver of the requirement to submit a GRE or other standardized test score.

Continuous enrollment requirements and expectations

To remain in good standing, students must maintain continuous registration for each fall and spring semester (except for approved leaves of absence) until they have completed all requirements. Students who fail to register for two consecutive semesters (summer sessions included) will be dropped automatically from the program and must reapply for admission in order to continue. Exceptions to this policy will be made on an individual basis by petition. Students who reapply after having been dropped for failure to register continuously will be evaluated under the bulletin requirements in effect at the time of readmittance.

A minimum GPA of 3.0 on a 4.0 scale must be maintained. Compliance with other university regulations also is required.

Part-time students

Since the school schedules many of its courses in the late afternoon or evening, its programs accommodate both full- and part-time students. Students also may take advantage of courses offered in the summer. Thus it is possible for a part-time student taking six credit hours per semester to finish the master's degree in four years or less.

Nondegree-seeking students

Nondegree-seeking students must have an undergraduate degree from an accredited institution and the written approval of the instructor prior to registering for any graduate-level course. Nondegree-seeking students can take no more than six credit hours without authorization from the appropriate program coordinator.

Financial aid information

Information and application forms for financial aid may be secured from the VCU Office of Financial Aid, Harris Hall, 1015 Floyd Ave., First Floor, Box 843026, Richmond, VA 23284-3026.

The L. Douglas Wilder School of Government and Public Affairs also offers a limited amount of financial assistance. Individuals interested in

such assistance are urged to apply by March 30. Financial assistance available through the school includes:

- **Graduate teaching assistant positions** – Duties involve helping with the instruction of courses. The level of support varies according to the work level, financial need and scholarship.
- **Research assistant positions** – The stipend and number of positions depend upon the level of sponsored research carried out by the school each year.
- **Tuition fellowships** – There are a limited number of tuition fellowships for full-time students within the three master's degree programs.
- **T. Edward Temple Memorial Scholarship Award** – This award of approximately $500 per year is given to an outstanding graduate student in the Master of Urban and Regional Planning program each year.
- **The Senator Edward E. Willey Scholarship, the Virginia City Management Association/University Dr. T. Edward Temple Scholarship and the Leigh E. Grosenick Scholarship** – These scholarships are available to outstanding students in the Master of Public Administration program. Preference for these three scholarships is given to those who plan public careers in Virginia.
- **Internships** – Paid, on-the-job internships are widely available in the Richmond area and elsewhere and are encouraged. VCU graduates also have been successful in obtaining presidential management internships in the federal government, state-government professional positions and local government positions.

Transfer credit

With the consent of the admission committee or program coordinator, a maximum of six semester hours of appropriate graduate credit may be transferred and applied toward the Master of Science in Criminal Justice, the Master of Public Administration or the Master of Urban and Regional Planning. These hours will not have been credited toward another degree.

Schoolwide master's-level requirements

In addition to the program-specific requirements of the Master of Public Administration, the Master of Science in Criminal Justice and the Master of Urban and Regional Planning as outlined elsewhere in this bulletin, the Wilder School requires all master's-level graduate degree-seeking students to acquire competence in four broad areas:

1. Research methods
2. Planning and/or policy analysis
3. Public administration
4. Ethics

Competence can be demonstrated by completion of the following:

Course	Title	Hours
Research methods		
URSP/CRJS/GVPA/PADM 623	Research Methods for Government and Public Affairs	3
Planning/policy analysis		
Select one of the following:		3
PADM/GVPA 625	Public Policy Analysis	
URSP/GVPA 632	Planning Theory and Processes	
Public administration		
PADM/GVPA 601	Principles of Public Administration	3
Ethics		
Select one of the following options:		3
Option A:		
PADM/GVPA/PHIL 683	Administrative Ethics	
Option B:		
A program-specific course through which ethical issues are imbedded and discussed within a public sector context. Such courses would include:		
CRJS 550	Professional Ethics and Liability	
PADM 661	Nonprofit Law, Governance and Ethics	
PADM 689	Seminar in Public Administration: Integration of Theory and Practice	
URSP/GVPA 632	Planning Theory and Processes	
URSP 635	Legal and Legislative Foundations of Planning	

Selection of courses to meet these competency requirements will be made by the student in consultation with his/her academic adviser. While each graduate of the Wilder School must demonstrate competence in each of the areas outlined above, substitutions for the specific courses may be made with the written approval of the appropriate graduate program coordinator.

Criminal Justice, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The Certificate in Criminal Justice is a post-baccalaureate graduate program designed to help facilitate career advancement in the criminal justice and/or criminology field. The program seeks to develop critical-thinking skills among the students through the use of current criminal justice and criminological topics, reports and research findings.

This certificate program offers specialization for individuals interested or involved in law enforcement, corrections, juvenile justice or the courts. It combines survey and theory courses with research, management and policy courses on the justice system. The courses in the certificate program are the same as the master's courses. With minimum grades of B and upon acceptance into the master's degree program, these courses are fully transferable to the Master of Science (M.S.) in Criminal Justice degree program.

Student learning outcomes

1. Students will identify concepts and issues that are relevant and/or appropriate for the research or content area.
2. Students will demonstrate logical connections in concepts, facts and information identified in the literature.
3. Students will be able to solve a problem, write a research paper or make a line of argument on a particular criminal justice topic.
4. Students will be able to exemplify the trivium of learning.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

The Post-baccalaureate Certificate in Criminal Justice program offers an abbreviated graduate-level course sequence of 15 credit hours for individuals with an academic and/or professional background in criminal justice. Applicants must meet all general admission requirements of the VCU Graduate School. (p. 34)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), five courses are required for the certificate, as specified in the chart list that follows. To receive the certificate, the student must achieve a B average in the five courses, earn no more than one C grade and complete the 15-hour certificate program within three years.

Curriculum requirements

Required courses

Course	Title	Hours
CRJS 501	Principles of Criminal Justice	3
CRJS/GVPA/PADM/URSP 623	Research Methods for Government and Public Affairs	3
Total Hours		6

Electives

Course	Title	Hours
Select three of the following:		9
CRJS 550	Professional Ethics and Liability	
CRJS 616	Justice Policy and Administration	
CRJS 641	Jurisprudence	
Other graduate-level elective (only three credit hours of internship are applicable to the certificate)		
Total Hours		9

Total graduate credit hours required (minimum) 15

Graduate program director
Amy Cook, Ph.D.
Program chair, Criminal Justice
Email: cookak@vcu.edu

Additional contacts
Christina Mancini, Ph.D.
Assistant chair, Criminal Justice
Email: cnmancini@vcu.edu

Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: **dleehing@vcu.edu**
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/criminal/certificate.html (http://wilder.vcu.edu/academic/criminal/certificate.html)

Criminal Justice, Master of Science (M.S.)

Program goal

The M.S. degree program in criminal justice assists in broadening and refining the understanding of criminal justice and criminological issues to facilitate career success and advancement. The goal of the program is to develop critical-thinking skills among the students through the use of current criminal justice and criminological topics, reports and research findings.

Student learning outcomes

1. Apply the principles of criminal justice — landmark laws, principles of justice, structured decision-making and review of policies, procedures and decisions — to dilemmas in the field of criminal justice.
2. Apply the principles of ethical thought to dilemmas in the field, involving law, police, courts and corrections, taken from past court cases and classic literature.
3. Review and analyze the theories of criminology to develop approaches to crime prevention programs.
4. Use research methodology to construct, design and evaluate policies and programs in criminal justice.
5. Assess current implementation of criminal justice policies, laws and procedures in the creation of laws, their enforcement and application by the courts as race, class and gender affect them.
6. Integrate knowledge of criminological theory, law and methodology to pose and solve questions of crime and justice.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 1 (Mar 1 for financial aid)	GRE, LSAT or GMAT
	Spring	Oct 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester. Please contact the program chair with specific application questions.

In addition to the general admission requirements of the VCU Graduate School (p. 34), admission to the Master of Science in Criminal Justice also will be based on:

1. An undergraduate GPA that exceeds 2.7 overall
2. A satisfactory score on the graduate standardized test (GRE, LSAT or GMAT)
3. Previous evidence of ability to perform graduate-level work (where applicable)
4. Professional experience in criminal justice (where applicable)

The courses in the post-baccalaureate graduate Certificate in Criminal Justice program are the same as the master's courses. With minimum grades of B and, upon acceptance into the master's degree program, courses from the certificate program are fully transferable to the Master of Science in Criminal Justice degree program.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements), the Master of Science in Criminal Justice requires a minimum of 30 graduate credit hours of course work, with a minimum overall grade-point average of 3.0. Students who do not have at least one year of professional-level experience are

encouraged to take a three-credit-hour internship as part of the 30 semester hours.

To complete the M.S. curriculum, students must submit a portfolio of their work before they graduate. Contact the program director for format and submission details.

A maximum of nine semester hours of graduate credit from an accredited institution may be transferred and applied toward the master's degree. All transfer requests require the approval of the graduate program coordinator and the Graduate School and may not have been counted toward another degree.

Curriculum requirements

Course	Title	Hours
Core courses		
CRJS 501	Principles of Criminal Justice	3
CRJS 550	Professional Ethics and Liability	3
CRJS 620	Seminar in Criminology	3
CRJS/GVPA/PADM/URSP 623	Research Methods for Government and Public Affairs	3
CRJS 617	Law and Criminal Justice Policy	3
CRJS 690	Criminal Justice Policy Analysis	3
Electives [1]		
Select 12 credits in consultation with an adviser.		12
Total Hours		30

[1]Any additional CRJS, GVPA, HSEP or PADM course (not in the core) may be used as an elective. Other course(s) may be selected with permission of the criminal justice graduate coordinator.

Total graduate credit hours required (minimum) 30

Graduate program director
Amy Cook, Ph.D.
Program chair, Criminal Justice
Email: cookak@vcu.edu

Additional contacts
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Assistant chair, Criminal Justice
Email: cnmancini@vcu.edu

Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: **dleehing@vcu.edu**
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/criminal/grad.html (http://wilder.vcu.edu/academic/criminal/grad.html)

Gender Violence Intervention, Certificate in (Post-baccalaureate graduate certificate)

Program mission

The graduate Certificate in Gender Violence Intervention is designed to prepare individuals for positions related to understanding, studying, responding to and preventing sexual and domestic violence in a variety of communities and settings. It provides specialized study in gender violence and can be earned on its own, or in conjunction with another graduate degree in the Wilder School of Government and Public Affairs or the School of Social Work.

Program goals

1. The program will guide students in the development of strong academic understanding related to gender violence intervention.
2. The program will guide students in the development of skills in applying academic concepts to the practice of gender violence intervention.

Student learning outcomes

1. Academic understanding
   a. Students will have knowledge of common types of gender violence.
   b. Students will have knowledge of theoretical perspectives of gender violence.
   c. Students will have knowledge of gender violence policies.
2. Skills
   a. Students will have the ability to demonstrate methods of applying concepts to problems, practice and policy.
   b. Students will demonsrate professional behaviors and boundaries while working in GVI settings and with diverse populations.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Students with a B.A. or B.S. degree are eligible for admission into the certificate program. Relevant course work or practical experience will be considered in evaluating admission and substitution of courses. No more than six hours of substitution or equivalency credit will be granted. An overall GPA of 3.0 is required to receive the certificate, and no more than one grade of C may be earned in the certificate program curriculum.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a total of 15 graduate credit hours is required to earn the Certificate in Gender Violence Intervention. Five courses are required, including an internship (three credit hours) that offers the opportunity for involvement in all phases of work in this field.

Curriculum requirements

Required courses

Course	Title	Hours
GVPA 623	Research Methods for Government and Public Affairs	3
GVPA 635	Theorizing Gender Violence	3
GVPA 693	Internship	3
PADM 650	Principles of Nonprofit Management	3
SLWK 761	Interpersonal Violence	3
Total Hours		15

Total graduate credit hours required (minimum) 15

Students pursuing the Certificate in Gender Violence Intervention have an opportunity to combine their studies with a Master of Social Work (p. 822).

The combined Master of Social Work and Certificate in Gender Violence Intervention is a coordinated effort among the L. Douglas Wilder School of Government and Public Affairs, the School of Social Work and community advocates working in the area of sexual and domestic violence.

Application process

Apply online at **VCU Graduate Admissions**. For additional information, contact:

Elizabeth Cramer, Ph.D.
Professor, School of Social Work
ecramer@vcu.edu
Phone: (804) 828-9029

Sarah Jane Brubaker, Ph.D.
Director, Gender Violence Intervention Program
sbrubaker@vcu.edu
Phone: (804) 827-2400

Graduate program director
Sarah Jane Brubaker, Ph.D.
Associate professor
Email: sbrubaker@vcu.edu
Phone: (804) 827-2400

Additional contact
Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/certificate/intervention.html (http://www.wilder.vcu.edu/academic/certificate/intervention.html)

Social Work, Master of (M.S.W.)/Gender Violence Intervention, Certificate in (Post-baccalaureate graduate certificate) [combined]

The combined Master of Social Work and Certificate in Gender Violence Intervention program is a collaborative effort among the L. Douglas Wilder School of Public Affairs, the School of Social Work and community advocates working in the area of sexual and domestic violence. The certificate requires a total of 15 credit hours.

To enroll in the Certificate in Gender Violence Intervention simultaneously with the M.S.W., students must complete a graduate application for the certificate program and pay the required fee to Graduate Admissions; however, no supporting information is required for students who are already enrolled in good standing in the M.S.W. program.

Applicants will need to complete an online admission application and select from the drop down menu “GVI Certificate.” Applicants then pay the application fee and attach an essay on why they wish to be in the program. Students should also indicate on the right-hand side of the admission application that they are currently in the M.S.W. program, which will alert the admissions office that the application can be sent directly to the program chair for an admissions decision.

Please arrange for references and transcripts to be forwarded to the Wilder School graduate studies office from the School of Social Work and

they will be added to the admission application. **Students should indicate in the "Comments" section of the application form that they are already enrolled in the M.S.W. program.**

Additional information may be obtained from Virginia Commonwealth University, School of Social Work, Box 842027, Richmond, VA 23284-2027, Attention: Elizabeth Cramer, Ph.D., [ecramer@vcu.edu; (804) 828-9027], Certificate in Gender Violence Intervention Adviser. Detailed information about the Certificate in Gender Violence Intervention is available from Sarah Jane Brubaker, Ph.D., Wilder School [sbrubaker@vcu.edu; (804) 827-2400]. Certificate courses can be completed after M.S.W. degree requirements have been completed as long as there is continuous enrollment. All M.S.W. students interested in the certificate should check the course schedule for changes and other course offerings.

See the individual program pages for specific admission requirements, application deadlines, program goals, student learning outcomes, degree requirements and graduation requirements for the M.S.W. and Certificate in Gender Violence Intervention programs.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.W. and	Fall	Jul 15	
Post-baccalaureate graduate certificate	Spring	Nov 15	

Curriculum requirements

Course	Title	Hours
Required courses		
GVPA 623	Research Methods for Government and Public Affairs [1]	3
GVPA 635	Theorizing Gender Violence	3
GVPA 693	Internship [2]	3
PADM 650	Principles of Nonprofit Management [3]	3
SLWK 761	Interpersonal Violence	3
Total Hours		15

1

GVPA 623: satisfied by SLWK 706-SLWK 707 or SLWK 714-SLWK 715 [clinical or social work planning, administrative and policy practice research course (three credit hours)].

2

GVPA 693: satisfied by SLWK 693-SLWK 694, SLWK 695; or SLWK 793-SLWK 794, SLWK 795 [a social work field practicum in an agency providing sexual or domestic violence services (three credit hours)].

3

PADM 650: satisfied by SLWK 602-SLWK 606 (three credit hours).

Total graduate credit hours required (minimum) for the Certificate in Gender Violence Intervention for students in the M.S.W. program 15

Field placements

Once students are admitted and enrolled in the certificate program, they should consult the certificate adviser when they choose their field placements to ensure that at least one placement is conducted in a setting that addresses gender violence.

Graduate program directors
Melissa D. Stewart, Ph.D.
Director, M.S.W. Program
Email: mdstewart2@vcu.edu
Phone: (804) 828-2007

Sarah Jane Brubaker, Ph.D.
Director, Gender Violence Intervention Program
Email: sbrubaker@vcu.edu
Phone: (804) 827-2400

Additional contact
Denia A. Lee-Hing, Ed.D.
Director of graduate studies, Wilder School
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program websites: socialwork.vcu.edu (http://socialwork.vcu.edu) and wilder.vcu.edu/academic/certificate/intervention.html (http://wilder.vcu.edu/academic/certificate/intervention.html)

Geographic Information Systems, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The graduate Certificate in Geographic Information Systems emphasizes the core functions and applications of GIS. It provides specialized training in the operations and techniques related to the creation, analysis, modeling, visualization, interpretation and management of geographic information.

The certificate program is designed to meet the educational needs of both traditional and nontraditional students. The GIS program prepares traditional students to utilize GIS in their major areas of study. Nontraditional students can also take advantage of the certificate program to learn and/or upgrade GIS knowledge and skills that are applicable and important to their professions.

Student learning outcomes

1. Students should display evidence of having developed a multidisciplinary understanding of urban life.
2. Students will demonstrate an understanding of, and a willingness to act in accordance with, the ethics and values of the professional.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

Special requirements

- Only applicants with prior GIS training, course work or work experience are considered for spring admissions. Other applicants should apply for fall admission due to course sequencing and prerequisites.
- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the prerequisites and general criteria of eligibility for admission to the GIS certificate program include:

1. Completion of an official application form
2. Three letters of reference
3. Letter of intent describing interest in applying for the Certificate in Geographic Information Systems
4. An official transcript showing successful completion of baccalaureate degree or its equivalent from an accredited college or university with a minimum grade point average of 2.7 (out of 4.0) in the last 60 hours of undergraduate study

At any time, students in the GIS certificate program may apply for admission into the Master of Urban and Regional Planning, the Master of Public Administration or the Master of Science in Criminal Justice degree programs. If accepted into a master's program, students may then transfer credits earned in the GIS certificate program toward partial fulfillment of the master's degree.

Degree requirements

The Certificate in Geographic Information Systems can be completed in one academic year. In addition to general VCU Graduate School graduation requirements (p. 31), students must complete 12 graduate credit hours of GIS course work that includes two required and two elective courses with a minimum grade-point average of 3.0 (out of 4.0).

Curriculum requirements

Required courses

Course	Title	Hours
URSP 621	Introduction to Geographic Information Systems (offered in fall semester)	3
URSP 625	Spatial Database Management and GIS Modeling (offered in spring semester)	3
Total Hours		6

Electives

Course	Title	Hours
Select two of the following:		6
URSP 622	Community Socioeconomic Analysis Using GIS (offered in fall semester)	
URSP 626	Transportation Analytics and Modeling (offered in spring semester)	
URSP 627	GIS Applications in Urban Design (offered in spring semester)	
Total Hours		6

Total graduate credit hours required (minimum) 12

Other GIS-related courses may be approved by the program chair or certificate program coordinator.

All credits earned in the certificate program are transferable to the Master of Science in Criminal Justice, the Master of Public Administration or the Master of Urban and Regional Planning programs. However, students must apply to the certificate and master's degree programs separately.

Sample plan of study

The following schedule is suggested as a means of completing the certificate program:

Fall semester		Hours
URSP 621	Introduction to Geographic Information Systems	3
One GIS-related elective (see list above) or other approved course		3
	Term Hours:	6
Spring semester		
URSP 625	Spatial Database Management and GIS Modeling	3
One GIS-related elective (see list above) or other approved course		3
	Term Hours:	6
	Total Hours:	12

Other GIS-related courses may be approved by the program chair or certificate program coordinator.

Graduate program director
Damian Pitt, Ph.D.
Associate professor and program chair
Email: dpitt@vcu.edu
Phone: (804) 828-7397

Additional contacts
James Smither
Assistant professor and assistant program chair
Email: jcsmither@vcu.edu
Phone: (804) 827-0570

Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/certificate/geographic.html (http://www.wilder.vcu.edu/academic/certificate/geographic.html)

Homeland Security and Emergency Preparedness, Certificate in (Post-baccalaureate graduate certificate)

Program goal

This certificate program complements a student's other fields of interest in public and government affairs. The curriculum focuses upon international and domestic security and preparedness issues related to terrorist threats, such as the 9/11 attack, and natural disasters, such as Hurricane Katrina. Since the attacks of Sept. 11, 2001, homeland security and emergency preparedness has become a critical aspect of governmental policy at the federal, state and local levels, as well as within the private sector. The L. Douglas Wilder School of Government and Public Affairs believes that a stable and productive evolution of public and private sector policies in this area can only be achieved if academe recognizes and accepts its role in developing scholars, professional policy analysts and informed governmental decision makers.

Student learning outcomes

Students will achieve comprehension of the theory and practice of homeland security and emergency preparedness and be able to analyze policy and synthesize information.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

Special requirements

- Admission applications that do not have a decision will automatically carry over to the next semester for consideration.

Applicants must meet all general admission requirements of the VCU Graduate School. (p. 34)

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the graduate certificate program requires 15 credit hours, comprising five three-credit-hour graduate courses delivered through a combination of online technology and one on-campus session (three days) as described below. The courses offered in the certificate program are the same as those taken by students in the master's program. With minimum grades of B and upon acceptance into the master's program, these courses are fully transferable to the Master of Arts in Homeland Security and Emergency Preparedness degree program.

Online study

Web-based course delivery in an asynchronous format is designed around each course's own Blackboard site.

On-campus study

During the final week of the semester, the class will have a three-day in-class session from Thursday to Saturday. It will feature presentations and discussion of student projects and papers, as well as lectures, seminar sessions and exercises. Exceptions will be made for students who are unable to attend these sessions, such as active-duty military personnel or emergency managers involved in ongoing operations.

Curriculum requirements

Course	Title	Hours
HSEP 501	Institutional Challenges of Security Preparedness	3
HSEP 502	Survey of Terrorism	3
HSEP 601	Emergency Management: Response Planning and Incident Command	3
HSEP 602	Government, Industry and Community Strategic Planning	3
HSEP 603	Risk Assessment	3
Total Hours		15

Total graduate credit hours required (minimum) 15

Graduate program director
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Additional contacts
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Denia A. Lee-Hing, Ed.D.
Director of graduate studies
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Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/certificate/security.html (http://wilder.vcu.edu/academic/certificate/security.html)

Homeland Security and Emergency Preparedness, Master of Arts (M.A.)

Program goal

The Master of Arts in Homeland Security and Emergency Preparedness degree program is designed in the broadest interdisciplinary sense. Students will learn theoretical and practical knowledge that will prepare them for private or public sector employment in the expanding area of homeland security and emergency preparedness and/or further study in numerous areas of public policy. The curriculum focuses upon international and domestic security and preparedness issues related to terrorist threats, such as the 9/11 attack, and natural disasters, such as Hurricane Katrina. Since the attacks of Sept. 11, 2001, homeland security and emergency preparedness has become a critical aspect of governmental policy at the federal, state and local levels as well as within the private sector. The L. Douglas Wilder School of Government and Public Affairs believes that a stable and productive evolution of public and private sector policies in this area can only be achieved if academe recognizes and accepts its role in developing scholars, professional policy analysts and informed governmental decision makers.

The master's degree is primarily an off-campus, online, distance-learning program. It has both off-campus (online) and on-campus (at VCU) components. VCU's program takes a broad interdisciplinary approach to preparedness that will give students the ability to see the larger organizational, social, political, ethical and economic aspects of disaster

studies, in addition to the policy-making and implementation aspects. The scholarly study of homeland security and emergency preparedness rests at the intersection of national defense, emergency management, law enforcement and policy management. With expertise in criminal justice, geography, government (local, state, federal and foreign), international affairs, policy planning and public administration, the Wilder School is particularly well-suited for such a program. Its location in the state capital and situated just 90 minutes from the nation's capital also provides easy access to homeland security institutions and practitioners.

Student learning outcomes

1. Students will achieve comprehension of the theory and practice of homeland security and emergency preparedness and be able to analyze policy and synthesize information in four key areas: risk and vulnerability analysis, strategic planning dilemmas of disasters and disaster preparedness, institutional coordination, and intelligence operations and legal/constitutional aspects.
2. Students will develop advanced skills in expository writing and oral presentation.
3. Students will achieve comprehension of the theoretical and practical principles of emergency preparedness for both natural disasters and terrorist incidents and be able to analyze key topics related to natural disasters, emergency planning, terrorism and counterterrorism.
4. Students will perform research, policy analysis and risk assessment using several methodological and theoretical approaches to homeland security and emergency preparedness.
5. Students will also be able to evaluate scholarly and practitioner analyses of homeland security and emergency preparedness.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.A.	Fall	Apr 1 (Mar 1 for financial aid)	GRE, GMAT, MAT or LSAT
	Spring	October 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), selection is made on the basis of prior academic performance, professional accomplishments and other indicators of the ability to pursue graduate studies and a professional career in a field related to homeland security and emergency preparedness. The application for admission requires:

1. A transcript documenting the completion of a bachelor's degree
2. Three letters of reference (including both academic and professional references if possible)
3. A current resume
4. Satisfactory standardized test score (GRE, GMAT, MAT, LSAT)
5. A minimum 2.7 GPA (on a 4.0 scale) in the last 60 semester hours of undergraduate work

Students not meeting these requirements who have demonstrated advanced competency on a professional basis may be admitted to the program provisionally. The provisional period shall consist of the first nine hours of designated graduate work in which all grades must be no

less than B. Provisional admission does not constitute a waiver of the requirement related to a standardized test.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 36 graduate credit hours with a cumulative minimum GPA of 3.0.

Off-campus study

Web-based course delivery is designed around each course's own web-based site utilizing the Blackboard education system, which provides the following:

1. Course syllabus
2. Course reference materials and links to supporting websites
3. Course lectures
4. Faculty-student and student-student communications via weekly discussion topics
5. Student writing assignments

Participation in online discussions is mandatory and will count for a significant percentage of each student's grades. Written work is submitted, evaluated and returned to students via the Blackboard education system assignment function.

Curriculum requirements

Course	Title	Hours
EGMN 630	Technology, Security and Preparedness	3
HSEP 501	Institutional Challenges of Security Preparedness	3
HSEP 502	Survey of Terrorism	3
HSEP 601	Emergency Management: Response Planning and Incident Command	3
HSEP 602	Government, Industry and Community Strategic Planning	3
HSEP 603	Risk Assessment	3
HSEP 610	Law Enforcement Policy and Judicial Precedent	3
HSEP 620	Private Sector Issues in Security and Preparedness	3
HSEP 628	Survey of Cyber Security	3
HSEP 650	Public Health Preparedness	3
HSEP 690	Capstone Seminar	3
PADM/GVPA/CRJS/URSP 623	Research Methods for Government and Public Affairs	3
Total Hours		36

Total graduate credit hours required (minimum) 36

Graduate program director
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Additional contacts
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Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/security/grad.html (http://wilder.vcu.edu/academic/security/grad.html)

Nonprofit Management, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The program mission is to empower community leaders with the knowledge, theory, research and real-world applications needed to creatively solve public issues and shape public policy. The program equips current and future executives, boards, staff and volunteers to lead, govern and manage nonprofit organizations collaboratively, thoughtfully and ethically.

In the graduate Certificate in Nonprofit Management program, students gain knowledge and skills in nonprofit governance, management, fundraising, and program development and evaluation that they will need to become leaders and change agents in this rapidly growing sector. The school welcomes degree applicants from any undergraduate major, as entry- and top-level employees in nonprofit organizations have a wide range of backgrounds, including the sciences and humanities, social sciences, and technology. Courses are scheduled in the evening and on weekends with the working professional in mind.

Student learning outcomes

1. To understand the nonprofit sector's relationship to the for-profit and government sectors
2. To know how to build a fundraising and donor communication plan model
3. To understand how to budget and evaluate the financial management practices of nonprofit organizations
4. To have the skills to analyze and implement laws impacting nonprofit organizations and their governance

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin

and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	None
	Spring	Oct 1	

Special requirements

- Students who achieve a minimum GPA of 3.6 in certificate course work in the L. Douglas Wilder School of Government and Public Affairs are eligible to apply to the Master of Public Administration program, provided they do so before the completion of the certificate. The student must still formally apply and be admitted to the M.P.A. program. A 3.6 GPA in certificate work does not guarantee admission to the M.P.A. program.

In addition to the general admission requirements of the VCU Graduate School (p. 34), admission to the certificate program requires the same procedure used in applying to the M.P.A., except that a standardized examination is not required.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the certificate requires a total of 15 graduate credit hours, comprising four courses in the graduate public administration program and one elective. The elective may be from the public administration curriculum or from elsewhere within the school or university.

Curriculum requirements

Required courses

Course	Title	Hours
PADM 650	Principles of Nonprofit Management	3
PADM 656	Fund Development for the Nonprofit Sector	3
PADM 659	Financial Management for Nonprofit Organizations	3
PADM 661	Nonprofit Law, Governance and Ethics	3
Total Hours		12

Elective

Course	Title	Hours
Select one of the following:		3
PADM 583	Effective Managerial Communications	
PADM 584	Planned Organizational Change	
PADM 585	Power, Influence and Organizational Competence	
PADM 591	Topic Seminar	
PADM/GVPA 601	Principles of Public Administration	
PADM 602	Public Administration Theory	
PADM 603	Politics and Economics	
PADM 604	Comparative Public Institutions	
PADM/SOCY 605	Survey Research Methods	
PADM 606	Government Management Models	
PADM 607	Public Human Resource Management	
PADM 609	Financial Management in Government	
PADM 621	Organizational Behavior and Management in Government	
PADM 622	Public Sector Budgeting	
PADM/GVPA/CRJS/URSP 623	Research Methods for Government and Public Affairs	
PADM 624	Quantitative Methods for Public Administration (PADM 623 is a prerequisite for PADM 624)	
PADM/GVPA 625	Public Policy Analysis	
PADM 626	Intergovernmental Relations	
PADM 627	Workshop in Policy Analysis and Evaluation	
PADM/ENVS 628	Environmental Policy and Administration	
PADM/URSP 630	Strategic Planning and Management in the Public Sector	
PADM 637	Organic Human Resources Management	
PADM 642	Grants Management	
PADM 652	Administrative Law	

PADM 654	Program Design and Evaluation in the Nonprofit Sector
PADM 657	Nonprofit Advocacy and Government Relations
PADM 660	Community Power Dynamics
PADM 662	Advanced Topics in Revenue and Taxation
PADM 664	Local Government Administration
PADM 675	Comparative Public Administration
PADM 680	Executive Leadership Seminar
PADM 681	Governmental Administrative Decision-making Processes
PADM 682	Advanced Public Human Resources Management
PADM/PHIL/GVPA 683	Administrative Ethics
PADM 689	Seminar in Public Administration: Integration of Theory and Practice
PADM 691	Topics in Public Administration
One graduate three credit-hour course from elsewhere in the Wilder School or elsewhere in the university (with approval from the program chair)	
Total Hours	3

Total graduate credit hours required (minimum) 15

Graduate program director
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Additional contacts
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Program website: wilder.vcu.edu/academic/certificate/nonprofit.html (http://wilder.vcu.edu/academic/certificate/nonprofit.html)

Social Work, Master of (M.S.W.)/Nonprofit Management, Certificate in (Post-baccalaureate graduate certificate) [combined]

Through a cooperative arrangement with the L. Douglas Wilder School of Government and Public Affairs, Master of Social Work students pursuing the concentration in administration, planning and policy practice may simultaneously earn the post-baccalaureate graduate certificate in nonprofit management offered by the L. Douglas Wilder School of Government and Public Affairs.

Application process

To earn the Certificate in Nonprofit Management simultaneously with the M.S.W., it is necessary to complete a graduate admissions application for the certificate program; however, no supporting documents are required for students who are already enrolled in good standing in the M.S.W. degree program.

Certificate requirements for M.S.W. students

Social work students enrolled in the SWAPPP concentration are required to complete three nonprofit courses: PADM 656, PADM 659 and PADM 661. Two social work SWAPPP courses are substituted for six credit hours of the certificate's 15 credit-hour requirement. One of these courses is SLWK 712. The second course may be SLWK 711 or SLWK 713.

Note: M.S.W. students pursuing the clinical concentration must complete the entire 15 credit hours required for the Certificate in Nonprofit Management. Any six of the PADM nonprofit credit hours will satisfy the M.S.W. elective requirement for either concentration.

See the individual program pages for specific admission requirements, application deadlines, program goals, student learning outcomes, degree requirements and graduation requirements for the stand-alone M.S.W. and Certificate in Nonprofit Management programs.

Curriculum requirements

Course	Title	Hours
PADM 656	Fund Development for the Nonprofit Sector	3
PADM 659	Financial Management for Nonprofit Organizations	3
PADM 661	Nonprofit Law, Governance and Ethics	3
SLWK 712	Social Work Planning and Administrative Practice I	3
SLWK 711	Strategies for Social Work Planning and Administrative Practice	3
or SLWK 713	Social Work Planning and Administrative Practice II	
Total Hours		15

Total graduate credit hours required (minimum) for the Certificate in Nonprofit Management for students in the M.S.W. program SWAPPP concentration 15

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Program websites: socialwork.vcu.edu (http://www.socialwork.vcu.edu) and wilder.vcu.edu/academic/certificate/nonprofit.html (http://www.wilder.vcu.edu/academic/certificate/nonprofit.html)

Public Administration, Master of (M.P.A.), generalist curriculum

Program accreditation
National Association of Schools of Public Affairs and Administration

Program goals

The Master of Public Administration program's mission supports a "generalist" conception of public administration. This seems quite appropriate as the students come from diverse academic and employment backgrounds and find jobs in a wide variety of government and nonprofit organizations.

M.P.A. students may pursue a generalist curriculum (in which the four elective courses are selected from the M.P.A. program or any department or school at VCU) or an area of concentration. Many students will benefit from the depth in a specific area that a concentration provides. If a student pursues a concentration, the elective courses must come from the approved list of courses for that concentration area.

The program's mission includes the following goals:

1. Prepare professional public managers, public officials and citizens to meet the challenges of public service in both government and nonprofit sectors
2. Advance the state of knowledge in the field of public administration through scholarly research and publications
3. Serve the profession and local, state, federal and international communities by extending faculty expertise and intellectual resources

Student learning outcomes

1. Students will participate in and contribute to the policy process.
2. Students will lead and manage in public governance.
3. Students will solve problems and make decisions in public governance.
4. Students will communicate and interact with the workforce and citizenry.
5. Students will articulate and apply a public service perspective.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.A.	Fall	Apr 1 (Mar 1 for financial aid)	GRE, GMAT, MAT or LSAT
	Spring	Oct 1	
	Summer	Feb 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester. Please contact the program chair with specific application questions.

Master of Public Administration students may pursue a generalist curriculum (in which elective courses are selected from the M.P.A. program or any department or school at VCU) or an area of concentration (choose the generalist curriculum from the drop-down list of program

options when applying online). Many students will benefit from the depth in a specific area that a concentration provides.

Students who may benefit from in-depth study in a specific area have the flexibility to build a concentration tailored to their interest. Students who wish to pursue a concentration should declare it no later than the completion of their 12th credit hour. To declare, students should submit the M.P.A. form "Plan of Study and Concentration Declaration" (found in Appendix B of the M.P.A. handbook) to the program chair. This form ensures the concentration will be listed on the student's official graduation transcript.

In addition to the general admission requirements of the VCU Graduate School (p. 34), selection is made on the basis of prior academic performance, professional accomplishments and other indicators of the ability to pursue graduate studies and a professional career in public management successfully. Specifically, the application for admission requires a transcript documenting the completion of a bachelor's degree, three letters of reference (including both academic and professional references if possible), a current resume and a satisfactory standardized test score (GRE, GMAT, MAT or LSAT). Students submitting LSAT scores must have taken an undergraduate math course (algebra, statistics or finite mathematics) and passed with a minimum grade of C.

No applicant will be considered for admission to the M.P.A. program within two years of having been terminated from the program or of having been rejected for admission to the program.

Degree requirements

The Master of Public Administration program is designed to meet the graduate educational needs of pre-service and in-service professionals for careers in public management and analysis in the public and nonprofit sectors. The degree requires a minimum of 36 graduate credit hours (39 credit hours for students with less than one year of experience in the public or nonprofit sector). In addition to the general VCU Graduate School graduation requirements (p. 31), M.P.A. students must meet the following requirements:

1. Students must complete a minimum of 36 graduate credit hours, as approved, with an overall minimum GPA of 3.0. Students who do not have at least one year of professional-level experience in the public sector or in a nonprofit agency are required to earn three additional hours of credit in a public service practicum/internship (for a total of 39 graduate credit hours for the degree).
2. Students may have no more than two C grades to graduate. Students who earn a D or F in a course will be dismissed from the program.
3. Students who are required to take the practicum/internship will usually do so during the summer between the first and second years or during the last semester of course work. The practicum must include a minimum of 300 hours as required by the National Association of Schools of Public Affairs and Administration. The scheduling of the practicum will be flexible enough to accommodate the needs of those students who pursue the degree on a part-time basis. Each practicum will be negotiated between VCU and the host agency, including the scope of work to be performed by the student, the type and extent of supervision, both within the agency and from the university, and the stipend. A learning contract will be executed among the department, the agency and the student. A written student project is required to complete the internship.
4. All students are required to complete the courses in the core curriculum unless competence in the subject matter can be demonstrated on the basis of previous experience or course work. Course work that is waived must be replaced by approved substitutions in order to meet the minimum 36 (or 39) graduate credit hours required for the degree.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PADM/GVPA 601	Principles of Public Administration	3
PADM 602	Public Administration Theory	3
PADM 607	Public Human Resource Management	3
PADM 609	Financial Management in Government	3
PADM/GVPA/CRJS/URSP 623	Research Methods for Government and Public Affairs	3
PADM 624	Quantitative Methods for Public Administration	3
PADM/GVPA 625	Public Policy Analysis	3
PADM 689 or PADM 690	Seminar in Public Administration: Integration of Theory and Practice (capstone)	3
Total Hours		24

Generalist curriculum electives

Course	Title	Hours
Select four courses from the following public administration curriculum:		12
PADM 583	Effective Managerial Communications	
PADM 584	Planned Organizational Change	
PADM 585	Power, Influence and Organizational Competence	
PADM 591	Topic Seminar	
PADM 603	Politics and Economics	
PADM 604	Comparative Public Institutions	
PADM/SOCY 605	Survey Research Methods	
PADM 606	Government Management Models	
PADM 621	Organizational Behavior and Management in Government	
PADM 622	Public Sector Budgeting	
PADM 626	Intergovernmental Relations	
PADM 627	Workshop in Policy Analysis and Evaluation	
PADM/ENVS 628	Environmental Policy and Administration	
PADM/URSP 630	Strategic Planning and Management in the Public Sector	
PADM 637	Organic Human Resources Management	
PADM 642	Grants Management	
PADM 650	Principles of Nonprofit Management	
PADM 652	Administrative Law	
PADM 654	Program Design and Evaluation in the Nonprofit Sector	
PADM 656	Fund Development for the Nonprofit Sector	

PADM 657	Nonprofit Advocacy and Government Relations	
PADM 660	Community Power Dynamics	
PADM 661	Nonprofit Law, Governance and Ethics	
PADM 662	Advanced Topics in Revenue and Taxation	
PADM 664	Local Government Administration	
PADM 675	Comparative Public Administration	
PADM 680	Executive Leadership Seminar	
PADM 681	Governmental Administrative Decision-making Processes	
PADM 682	Advanced Public Human Resources Management	
PADM/PHIL/GVPA 683	Administrative Ethics	
PADM 691	Topics in Public Administration	
Total Hours		12

Internship

Course	Title	Hours
The following is required for students with less than one year of professional experience in the public or nonprofit sector:		0-3
GVPA 693	Internship	
Total Hours		0-3

Total graduate credit hours required (minimum) 36 or 39

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Denia A. Lee-Hing, Ed.D.
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Program website: wilder.vcu.edu/academic/pubadmin.html (http://wilder.vcu.edu/academic/pubadmin.html)

Public Administration, Master of (M.P.A.), accelerated Bachelor of Arts in Political Science (B.A.) to master's

Program accreditation
National Association of Schools of Public Affairs and Administration

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

This program permits selected students to earn the B.A. and M.P.A. in a minimum of five years by taking certain master's-level courses during the senior year of their undergraduate program. The program is restricted to students with strong credentials and a clear interest in careers in the public or nonprofit sector. To be eligible, students must have completed 90 credit hours of undergraduate course work and have an overall GPA of 3.0, with a GPA of 3.3 in political science courses. The accelerated program is limited to students majoring in political science who have a minimum of 9 credit hours in political science courses.

To be considered for acceptance into the program and before enrolling in 600-level M.P.A. courses, students must complete the application to graduate study, submit standardized test scores and supply the supporting information required for admission. Upon being accepted into the accelerated program, students must meet the same standards of performance as a graduate student that are described in detail in the satisfactory academic progress (p. 25) section of the Graduate Bulletin, must maintain a 3.0 GPA and must satisfactorily complete all of the requirements for the degree, as stated in this bulletin. Guidance to students admitted to the accelerated program is provided by the public administration program director. Students should contact the M.P.A. graduate director for more information about admission procedures.

To graduate with a bachelor's degree, a student must complete 120 credit hours of course work. Of these credits, 33 must be in political science. Of the 33 political science credit hours, the following 15 are required:

Course	Title	Hours
POLI 103	U.S. Government	3
POLI/INTL 105	International Relations	3
POLI 107	Political Theory	3
POLI 109	Comparative Politics	3
POLI 490	Senior Seminar	3
Total Hours		15

Students enrolled in the accelerated program may take up to six credits of graduate public administration courses in each of the final two semesters of their undergraduate course work. These courses are shared credit hours with the graduate program, meaning that they will be applied toward the undergraduate degree requirement and the graduate degree requirement. A maximum of 12 credit hours may be taken prior to the completion of the baccalaureate degree. The bachelor's degree will be awarded when the student has completed all requirements for the undergraduate degree, which may include the 12 graduate public administration credit hours.

The graduate courses that may be taken in the public administration program once a student is admitted to the accelerated program are as follows:

Course	Title	Hours
PADM/GVPA 601	Principles of Public Administration	3
PADM 602	Public Administration Theory	3
PADM 607	Public Human Resource Management	3
PADM 609	Financial Management in Government	3
PADM/GVPA/CRJS/URSP 623	Research Methods for Government and Public Affairs	3
PADM 624	Quantitative Methods for Public Administration (or a PADM elective course)	3
PADM 650	Principles of Nonprofit Management	3

All accelerated program students must have their course schedules approved by the graduate public administration program director prior to registration.

Program contact
Myung H. Jin, Ph.D.
Associate professor and assistant chair
Email: mhjin@vcu.edu
Phone: (804) 828-8812

Additional contact
Richard F. Huff, Ph.D.
Program chair
Email: rrhuff@vcu.edu
Phone: (804) 828-9813

Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/pubadmin.html (http://wilder.vcu.edu/academic/pubadmin.html)

Public Administration, Master of (M.P.A.)/ Juris Doctor (J.D.) from the University of Richmond [combined]

Program accreditation
National Association of Schools of Public Affairs and Administration

A cooperative arrangement with the University of Richmond School of Law makes it possible for students to receive a law degree from the University of Richmond and the Master of Public Administration from VCU. The dual degree program is designed to provide its graduates with competency in both public administration and law. This competency is applicable to areas of practice drawing upon knowledge and skills from each of these fields. The program brings together persons interested in both the broader aspects of public policy and government affairs and the law. It also brings together two fields that require complementary knowledge and skills that may be directed toward solving problems that are associated with the affairs of the government and nonprofit sectors. This integration of education in public administration and law draws on the contributions that each discipline can make to a professional knowledge base for practice in both fields.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Application process

Interested students must apply separately for and be admitted to the T.C. Williams School of Law at the University of Richmond and the Master of Public Administration program at VCU. Students who are accepted into the dual degree program are permitted to apply 12 credit hours of work in the M.P.A. degree program toward meeting the graduation requirements in the T.C. Williams School of Law and up to 12 credit hours of work in the University of Richmond law school toward meeting the graduation requirements for the M.P.A. This credit application enables participants in the dual degree program to complete the requirements for the J.D. and the M.P.A. in an estimated four years of full-time course work. Applicants for this program are required to meet all admission and academic standards of the T.C. Williams School of Law of the University of Richmond, the VCU Graduate School and the M.P.A. program.

Graduate program director
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Additional contacts
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Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/combined/masterpubadmin.html (http://wilder.vcu.edu/academic/combined/masterpubadmin.html)

Public Management, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The graduate certificate in public management is a program designed to enable practitioners in government and nonprofit organizations to acquire knowledge and skills in public administration without pursuing a full master's degree.

Student learning outcomes

1. Students will participate in and contribute to the policy process.
2. Students will lead and manage in public governance.
3. Students will articulate and apply a public service perspective.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

Special requirements

- Students who achieve a minimum GPA of 3.6 in certificate course work in the L. Douglas Wilder School of Government and Public Affairs are eligible to apply to the Master of Public Administration program, provided they do so before the completion of the certificate. The student must still formally apply and be admitted to the M.P.A. program. A 3.6 GPA in certificate work does not guarantee admission to the M.P.A. program.

In addition to the general admission requirements of the VCU Graduate School (p. 34), admission to the certificate program requires the same procedure in applying to the M.P.A., except that a standardized examination is not required.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the certificate requires a total of 18 hours of graduate credit hours involving a mix of required and elective courses. The courses are the same as those offered to M.P.A. students.

Curriculum requirements

Required courses

Course	Title	Hours
PADM 601	Principles of Public Administration	3
PADM 607	Public Human Resource Management	3
PADM 609	Financial Management in Government	3
Total Hours		9

Electives

Course	Title	Hours
Select three elective courses from the following:		9
PADM 583	Effective Managerial Communications	
PADM 584	Planned Organizational Change	
PADM 585	Power, Influence and Organizational Competence	
PADM 591	Topic Seminar	
PADM 602	Public Administration Theory	
PADM 603	Politics and Economics	
PADM 604	Comparative Public Institutions	
PADM/SOCY 605	Survey Research Methods	
PADM 606	Government Management Models	
PADM 621	Organizational Behavior and Management in Government	
PADM 622	Public Sector Budgeting	
PADM/GVPA/CRJS/URSP 623	Research Methods for Government and Public Affairs	
PADM 624	Quantitative Methods for Public Administration (PADM 623 is a prerequisite for PADM 624)	
PADM/GVPA 625	Public Policy Analysis	
PADM 626	Intergovernmental Relations	
PADM 627	Workshop in Policy Analysis and Evaluation	
PADM/ENVS 628	Environmental Policy and Administration	
PADM/URSP 630	Strategic Planning and Management in the Public Sector	
PADM 637	Organic Human Resources Management	
PADM 642	Grants Management	
PADM 650	Principles of Nonprofit Management	
PADM 652	Administrative Law	
PADM 654	Program Design and Evaluation in the Nonprofit Sector	
PADM 656	Fund Development for the Nonprofit Sector	
PADM 657	Nonprofit Advocacy and Government Relations	
PADM 659	Financial Management for Nonprofit Organizations	
PADM 660	Community Power Dynamics	
PADM 661	Nonprofit Law, Governance and Ethics	
PADM 662	Advanced Topics in Revenue and Taxation	
PADM 664	Local Government Administration	

PADM 675	Comparative Public Administration
PADM 680	Executive Leadership Seminar
PADM 681	Governmental Administrative Decision-making Processes
PADM 682	Advanced Public Human Resources Management
PADM/PHIL/GVPA 683	Administrative Ethics
PADM 689	Seminar in Public Administration: Integration of Theory and Practice
PADM 691	Topics in Public Administration
Other courses from elsewhere in the Wilder School or elsewhere in the university (with approval from the program chair)	
Total Hours	9

Total graduate credit hours required (minimum) 18

Graduate program director
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Additional contacts
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Denia A. Lee-Hing, Ed.D.
Director of graduate studies
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Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/certificate/public.html (http://wilder.vcu.edu/academic/certificate/public.html)

Public Policy and Administration, Doctor of Philosophy (Ph.D.)

Program mission

The mission of the Ph.D. in Public Policy and Administration program is to provide students with the knowledge and skills that will enable them to conduct original and scholarly research in academic institutions, governmental agencies and public policy research institutions. The purpose of the program is to prepare students for scholarly and leadership roles in government, universities, research organizations and other settings where knowledge and research skills in public policy and administration are needed. The doctoral program is committed to accomplishing this mission by creating an intellectually vibrant atmosphere for scholarship involving an active faculty from a broad spectrum of academic disciplines and substantial interaction with government agencies and community groups.

Program goals

1. Enable students to develop expertise in a particular area of public policy
2. Enable students to apply their knowledge and skills in order to conduct original and scholarly research

Student learning outcomes

1. Students will be able to expertly apply public policy theories, integrating relevant ideas, concepts and approaches from the humanities, social sciences, law and public administration to policy analysis, formulation and implementation.
2. Students will be able to demonstrate mastery of a particular area of public policy.
3. Students will be able to formulate appropriate research questions related to public policy and apply methodological knowledge to develop an appropriate research design for a research proposal.
4. Students will be able to conduct original and scholarly research on public policy issues.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 15 for assistantships	GRE, GMAT, MAT or LSAT
		Jan 30 final date for admission consideration	International applicants TOEFL

Special requirements

- Master's degree, J.D. or M.D. from an accredited university. Graduate assistantships are only awarded for fall admission. For students wishing to be considered for a limited number of fellowships, materials must be received no later than Dec. 15. Spring admissions are considered exceptions and will be considered on a case-by-case basis.

Admission is open to qualified persons without regard to age, physical disability, national origin, race, religion or gender. Admission is competitive. The admission process is intended to assure a reasonable fit between the student's professional and research interests and faculty expertise. Consequently, otherwise qualified applicants may be denied admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the program must hold a master's degree or a recognized post-baccalaureate degree in one of the professions such as law or medicine from an accredited institution of higher education. A standardized test score, fewer than five years old, is required. Accepted examinations include the Graduate Record Examination, the Graduate Management Admissions Test, the Miller Analogies Test and the Law School Admissions Test and the Test of English as a Foreign Language for international students. Professional experience is not required, but is considered desirable.

In order to apply for admission to the Ph.D. in Public Policy and Administration program, prospective students must submit:

1. A VCU application for graduate study
2. Transcripts from all previous colleges or universities
3. Scores from a standardized examination (GRE, GMAT, MAT or LSAT and TOEFL for international students)
4. Three letters of reference
5. A personal statement describing reasons for applying to the program
6. A current professional resume

Admission standards

Applicants are evaluated based on the entire admission package; however, the following provides some guidelines for a competitive application.

1. Cumulative minimum GPA of 3.6 (on a four-point scale) or equivalent for graduate-level work
2. Standardized examination scores less than five years old (GRE preferred)
3. Three references – a minimum of one academic recommendation attesting to the applicant's ability to succeed in doctoral-level work
4. Personal statement, resume, curriculum vitae that:
   a. Clearly articulates the applicant's academic research interests whereby a decision can be made as to the applicant's "fit" with the program
   b. Shows a clear indication of a faculty match and expertise for the applicant's research interests
   c. Displays enthusiasm for the field of public policy and administration
   d. Is well-written and error-free
5. All students admitted to the program must have completed prior to admission, or are required to complete during the first year, the following graduate-level courses (or their equivalents):
   a. Research methods (equivalent of PADM 623/GVPA 623/CRJS 623/URSP 623)
   b. Statistics (equivalent of PADM 624)
   c. Public policy, economics or administration/management

The primary admission deadline is Jan. 30 for enrollment to begin the following fall semester; however, materials must be received no later than Dec.15 from those students wishing to be considered for assistantships. A small number of special admissions may be offered (Oct.15 application deadline) for entry the following spring semester; however, these are considered on a case-by-case basis. Assistantships are only offered to those offered full-time admission in the fall. Applicants who wish to be considered for the Oct.15 deadline must include a letter requesting and justifying early admission. If the request for early consideration is not accepted, the application will be held over to the Jan. 30 application deadline for consideration for the following fall admission.

While VCU Graduate School policy allows up to six credit hours of course work to be taken as a nondegree-seeking student prior to formal admission, taking such courses in no way guarantees admission to the program. Also, transfer credit hours are only considered for elective courses. Core courses must be taken at VCU.

Application information is available from the L. Douglas Wilder School of Government and Public Affairs Office of Graduate Advising or the Graduate Admissions Office. International applicant information and materials are available from International Admissions (http://international.admissions.vcu.edu).

Degree requirements

The doctoral program is structured around a core curriculum and four areas of concentration. The curriculum is designed to provide a sound intellectual foundation for the pursuit of scholarly research in areas of public policy, urban and regional policy, public administration and criminal justice policy. Students will select a concentration after the first year of study and after passing the comprehensive examination.

In addition to general VCU Graduate School graduation requirements (p. 31), students take a minimum of 45 graduate credit hours of course work and dissertation research in addition to any prerequisites that might be necessary. Six of these courses are part of the core, and at least four are concentration courses. The remaining two electives are to be taken outside the concentration with additional methodology courses highly recommended. Required courses generally will be available on an evening or weekend schedule.

Course work in the Ph.D. program has a strong orientation toward research, both applied and theoretical. Where appropriate, course work may be linked to funded university projects or to external agency-based analytical work. Courses emphasize research, writing and presentation skills.

All students must take a comprehensive qualifying examination on the core course requirements and a written or oral comprehensive examination in the concentration and must be approved by the VCU Graduate School for degree candidacy before beginning work on their dissertations.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PPAD 711	Seminar in Public Policy I	3
PPAD 712	Seminar in Public Policy II	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 724	Seminar in Advanced Analytical Methods	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Total Hours		18

Concentration courses

All students will select a concentration after the first year of study and after passing the comprehensive examination. They will take four courses in one of the following areas of concentration. Courses will be selected from a list designated by the concentration committee for each area. The concentration committee will approve the program of study for each student in the concentration.

Course	Title	Hours
Select four courses in one of the following concentrations:		12
Criminal justice policy		
Public administration		
Public policy		
Urban and regional policy		
Total Hours		12

Refer to the program search function of the online VCU Bulletins for a complete description of concentration requirements.

Electives outside of the concentration

Students will take at least three elective courses outside the concentration with the approval of their advisers. Students may take courses at the 500-level or higher from other Ph.D. concentration areas (as listed under each concentration) and other programs, such as homeland security and emergency preparedness, criminal justice, public administration and urban and regional planning within the Wilder School. In addition, students may choose elective courses from among the following three-credit courses:

Course	Title	Hours
Select two of the following:		6
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
EDUS 711	Qualitative Methods and Analysis	
ENGL 661	Themes in Interdisciplinary Studies	
EPID 603	Public Health Policy and Politics	
GSWS 602	Feminist Research Epistemology and Methods	
GSWS 622	Women and Public Policy	
HADM 763	Applied Health Services Research	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
MASC 613	Mass Media and Society	
MATX 601	Texts and Textuality	
NURS 770	Quantitative Research	
NURS 772	Qualitative Research	
OPER/STAT 636	Machine Learning Algorithms	
Total Hours		6

Dissertation research

Course	Title	Hours
PPAD 898	Dissertation Research (minimum nine credits)	9

Total graduate credit hours required (minimum) 45

Qualifying examinations

After completing all of the core courses in the Ph.D. program, each student takes a **comprehensive qualifying examination on the core.** The examination is designed to evaluate the mastery students have achieved over the body of knowledge represented by the core. It is intended to measure the ability of students to organize, integrate and creatively apply the knowledge in the field to important problems. Although organized around the courses in the core, the examination is not restricted to material covered in those courses. It is expected that doctoral students will read well beyond the confines of individual courses.

In order to continue in the program, students must attempt the qualifying examination no later than the next regular semester following the completion of the core course requirements. They must pass the exam by the end of the second regular semester after completing the core course requirements. A student may attempt the examination twice. Examinations are offered twice per year.

A student also must take a **written or oral comprehensive examination in the concentration**. The concentration faculty will determine the form

of the examination. A student may attempt the examination twice. Each student must pass this second examination before defending a dissertation proposal.

Dissertation

After completing all course work for the concentration and passing both qualifying examinations, students must prepare a dissertation involving original research that contributes to the body of knowledge in the field. A committee approved by the associate dean of the Wilder School supervises the dissertation work. The chair of the committee must be appointed as graduate faculty and be a core or affiliate faculty member of the Ph.D. program.

The first formal step in the dissertation process is the development and defense of a dissertation prospectus that frames the problem to be studied, provides background on the problem, presents a review of relevant literature and justifies the methodology to be used. The defense of the prospectus as well as the completed dissertation must be presented orally and be approved by the dissertation committee. The dissertation defense is conducted in a forum open to other students and faculty.

Sample plan of study

Year one		
Fall semester		**Hours**
PPAD 711	Seminar in Public Policy I	3
PPAD 717	Law and Public Policy [1]	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
	Term Hours:	9
Spring semester		
PPAD 712	Seminar in Public Policy II	3
PPAD 716	Public Policy Economics [1]	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
	Term Hours:	9
Summer semester		
Electives [2]		variable
Other optional courses		variable
	Term Hours:	0
Year two		
Fall semester		
PPAD 724	Seminar in Advanced Analytical Methods	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Concentration courses		6
First comprehensive examination on the core		
	Term Hours:	12
Spring semester		
Concentration courses and electives		variable
	Term Hours:	0
Year three		
Fall semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
Second comprehensive examination on the concentration		
Electives		variable
	Term Hours:	1-12
Spring semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
	Term Hours:	1-12
	Total Hours:	32-54

1

Recommended: See concentration listings for required and elective courses.

2

Students on 12-month assistantships are required to register for a minimum of three graduate credit hours.

Total graduate credit hours required (minimum) 45

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Program website: wilder.vcu.edu/academic/pubpolicy.html (http://wilder.vcu.edu/academic/pubpolicy.html)

Public Policy and Administration, Doctor of Philosophy (Ph.D.) with a concentration in criminal justice policy

Program mission

The mission of the Ph.D. in Public Policy and Administration program is to provide students with the knowledge and skills that will enable them to conduct original and scholarly research in academic institutions, governmental agencies and public policy research institutions. The purpose of the program is to prepare students for scholarly and leadership roles in government, universities, research organizations and other settings where knowledge and research skills in public policy and administration are needed. The doctoral program is committed to accomplishing this mission by creating an intellectually vibrant atmosphere for scholarship involving an active faculty from a broad spectrum of academic disciplines and substantial interaction with government agencies and community groups.

Program goals

1. Enable students to develop expertise in a particular area of public policy
2. Enable students to apply their knowledge and skills in order to conduct original and scholarly research

Student learning outcomes

1. Students will be able to expertly apply public policy theories, integrating relevant ideas, concepts and approaches from the humanities, social sciences, law and public administration to policy analysis, formulation and implementation.
2. Students will be able to demonstrate mastery of a particular area of public policy.
3. Students will be able to formulate appropriate research questions related to public policy and apply methodological knowledge to develop an appropriate research design for a research proposal.
4. Students will be able to conduct original and scholarly research on public policy issues.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 15 for assistantships	GRE, GMAT, MAT or LSAT
		Jan 30 final date for admission consideration	International applicants TOEFL

Special requirements

- Master's degree, J.D. or M.D. from an accredited university. Graduate assistantships are only awarded for fall admission. For students wishing to be considered for a limited number of fellowships, materials must be received no later than Dec. 15. Spring admissions are considered exceptions and will be considered on a case-by-case basis.

Admission is open to qualified persons without regard to age, physical disability, national origin, race, religion or gender. Admission is competitive. The admission process is intended to assure a reasonable fit between the student's professional and research interests and faculty expertise. Consequently, otherwise qualified applicants may be denied admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the program must hold a master's degree or a recognized post-baccalaureate degree in one of the professions such as law or medicine from an accredited institution of higher education. A standardized test score, fewer than five years old, is required. Accepted examinations include the Graduate Record Examination, the Graduate Management Admissions Test, the Miller Analogies Test and the Law School Admissions Test and the Test of English as a Foreign Language for international students. Professional experience is not required, but is considered desirable.

In order to apply for admission to the Ph.D. in Public Policy and Administration program, prospective students must submit:

1. A VCU application for graduate study
2. Transcripts from all previous colleges or universities
3. Scores from a standardized examination (GRE, GMAT, MAT or LSAT and TOEFL for international students)
4. Three letters of reference
5. A personal statement describing reasons for applying to the program
6. A current professional resume

Admission standards

Applicants are evaluated based on the entire admission package; however, the following provides some guidelines for a competitive application.

1. Cumulative minimum GPA of 3.6 (on a four-point scale) or equivalent for graduate-level work
2. Standardized examination scores less than five years old (GRE preferred)
3. Three references – a minimum of one academic recommendation attesting to the applicant's ability to succeed in doctoral-level work
4. Personal statement, resume, curriculum vitae that:
   a. Clearly articulates the applicant's academic research interests whereby a decision can be made as to the applicant's "fit" with the program
   b. Shows a clear indication of a faculty match and expertise for the applicant's research interests
   c. Displays enthusiasm for the field of public policy and administration
   d. Is well-written and error-free
5. All students admitted to the program must have completed prior to admission, or are required to complete during the first year, the following graduate-level courses (or their equivalents):
   a. Research methods (equivalent of PADM 623/GVPA 623/CRJS 623/URSP 623)
   b. Statistics (equivalent of PADM 624)
   c. Public policy, economics or administration/management

The primary admission deadline is Jan. 30 for enrollment to begin the following fall semester; however, materials must be received no later than Dec.15 from those students wishing to be considered for assistantships. A small number of special admissions may be offered (Oct.15 application deadline) for entry the following spring semester; however, these are considered on a case-by-case basis. Assistantships are only offered to those offered full-time admission in the fall. Applicants who wish to be considered for the Oct.15 deadline must include a letter requesting and justifying early admission. If the request for early consideration is not accepted, the application will be held over to the Jan. 30 application deadline for consideration for the following fall admission.

While VCU Graduate School policy allows up to six credit hours of course work to be taken as a nondegree-seeking student prior to formal admission, taking such courses in no way guarantees admission to the program. Also, transfer credit hours are only considered for elective courses. Core courses must be taken at VCU.

Application information is available from the L. Douglas Wilder School of Government and Public Affairs Office of Graduate Advising or the Graduate Admissions Office. International applicant information and materials are available from International Admissions (http://international.admissions.vcu.edu).

Degree requirements

The doctoral program is structured around a core curriculum and four areas of concentration. The curriculum is designed to provide a sound intellectual foundation for the pursuit of scholarly research in areas of public policy, urban and regional policy, public administration and criminal justice policy. Students will select a concentration after the first year of study and after passing the comprehensive examination.

In addition to general VCU Graduate School graduation requirements (p. 31), students take a minimum of 45 graduate credit hours of course work and dissertation research in addition to any prerequisites that might be necessary. Five of these courses are part of the core, and at least four are concentration courses. The remaining three electives are to be taken outside the concentration with additional methodology courses highly recommended. Required courses generally will be available on an evening or weekend schedule.

Course work in the Ph.D. program has a strong orientation toward research, both applied and theoretical. Where appropriate, course work may be linked to funded university projects or to external agency-based analytical work. Courses emphasize research, writing and presentation skills.

All students must take a comprehensive qualifying examination on the core course requirements and a written or oral comprehensive examination in the concentration and must be approved by the VCU Graduate School for degree candidacy before beginning work on their dissertations.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PPAD 711	Seminar in Public Policy I	3
PPAD 712	Seminar in Public Policy II	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Total Hours		15

Criminal justice policy concentration

Course	Title	Hours
Concentration courses (required)		
PPAD 761	Risk Assessment in Criminal Justice	3
Additional research methods or statistics course (within or outside the Wilder School)		3
Concentration electives		
Select six credits from the following:		6
PPAD 760	Criminal Justice Policy and Program Evaluation	
PPAD 791	Topical Seminar	
PPAD 792	Independent Study	
Total Hours		12

Electives outside of the concentration

Students will take at least three elective courses outside the concentration with the approval of their advisers. Students may take courses at the 500-level or higher from other Ph.D. concentration areas (as listed under each concentration) and other programs such as homeland security, criminal justice, public administration and urban and regional planning within the Wilder School. In addition, students may choose elective courses from among the following 3-credit courses:

Course	Title	Hours
Select three of the following:		9
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
EDUS 711	Qualitative Methods and Analysis	
ENGL 661	Themes in Interdisciplinary Studies	
EPID 603	Public Health Policy and Politics	
GSWS 602	Feminist Research Epistemology and Methods	
GSWS 622	Women and Public Policy	
HADM 763	Applied Health Services Research	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
INTL/NURS 514	International Perspectives on Community Health in Developing Countries	
MASC 613	Mass Media and Society	
MATX 601	Texts and Textuality	
NURS 770	Quantitative Research	
NURS 772	Qualitative Research	
OPER/STAT 636	Machine Learning Algorithms	
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	
SWKD 705	Multivariate Analysis in Social Work and Human Services Research	
Total Hours		9

Dissertation research

Course	Title	Hours
PPAD 898	Dissertation Research (variable credit hours)	1-12

Total graduate credit hours required (minimum) 45

Qualifying examinations

After completing all of the core courses in the Ph.D. program, each student takes a **comprehensive qualifying examination on the core.** The examination is designed to evaluate the mastery students have achieved over the body of knowledge represented by the core. It is intended to measure the ability of students to organize, integrate and creatively apply the knowledge in the field to important problems. Although organized around the courses in the core, the examination is not restricted to material covered in those courses. It is expected that doctoral students will read well beyond the confines of individual courses.

In order to continue in the program, students must attempt the qualifying examination no later than the next regular semester following the completion of the core course requirements. They must pass the exam by the end of the second regular semester after completing the core course requirements. A student may attempt the examination twice. Examinations are offered twice per year.

A student also must take a **written or oral comprehensive examination in the concentration**. The concentration faculty will determine the form of the examination. A student may attempt the examination twice. Each student must pass this second examination before defending a dissertation proposal.

Dissertation

After completing all course work for the concentration and passing both qualifying examinations, students must prepare a dissertation involving original research that contributes to the body of knowledge in the field. A committee approved by the associate dean of the Wilder School supervises the dissertation work. The chair of the committee must be appointed as graduate faculty and be a core or affiliate faculty member of the Ph.D. program.

The first formal step in the dissertation process is the development and defense of a dissertation prospectus that frames the problem to be studied, provides background on the problem, presents a review of relevant literature and justifies the methodology to be used. The defense of the prospectus as well as the completed dissertation must be presented orally and be approved by the dissertation committee. The dissertation defense is conducted in a forum open to other students and faculty.

Sample plan of study

Year one		
Fall semester		**Hours**
PPAD 711	Seminar in Public Policy I	3
PPAD 717	Law and Public Policy [1]	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
	Term Hours:	9
Spring semester		
PPAD 712	Seminar in Public Policy II	3
PPAD 716	Public Policy Economics [1]	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
	Term Hours:	9
Summer semester		
Electives [2]		variable
Other optional courses		variable
	Term Hours:	0
Year two		
Fall semester		
PPAD 780	Synthesizing Seminar in Public Policy	3
Concentration courses		6
First comprehensive examination on the core		
	Term Hours:	9
Spring semester		
Concentration courses and electives		variable
	Term Hours:	0
Year three		
Fall semester		

PPAD 898	Dissertation Research (variable credit hours)	1-12
Second comprehensive examination on the concentration		
Electives		variable
	Term Hours:	1-12
Spring semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
	Term Hours:	1-12
	Total Hours:	29-51

[1]

Recommended: See concentration listings for required and elective courses.

[2]

Students on 12-month assistantships are required to register for a minimum of three graduate credit hours.

Total graduate credit hours required (minimum) 45

Graduate program director
Elsie Harper Anderson, Ph.D.
Associate professor
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Phone: (804) 828-7390

Additional contact
Denia A. Lee-Hing, Ed.D.
Director of graduate studies
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/pubpolicy.html (http://wilder.vcu.edu/academic/pubpolicy.html)

Public Policy and Administration, Doctor of Philosophy (Ph.D.) with a concentration in public administration

Program mission

The mission of the Ph.D. in Public Policy and Administration program is to provide students with the knowledge and skills that will enable them to conduct original and scholarly research in academic institutions, governmental agencies and public policy research institutions. The purpose of the program is to prepare students for scholarly and leadership roles in government, universities, research organizations and other settings where knowledge and research skills in public policy and administration are needed. The doctoral program is committed to accomplishing this mission by creating an intellectually vibrant atmosphere for scholarship involving an active faculty from a broad spectrum of academic disciplines and substantial interaction with government agencies and community groups.

Program goals

1. Enable students to develop expertise in a particular area of public policy
2. Enable students to apply their knowledge and skills in order to conduct original and scholarly research

Student learning outcomes

1. Students will be able to expertly apply public policy theories, integrating relevant ideas, concepts and approaches from the humanities, social sciences, law and public administration to policy analysis, formulation and implementation.
2. Students will be able to demonstrate mastery of a particular area of public policy.
3. Students will be able to formulate appropriate research questions related to public policy and apply methodological knowledge to develop an appropriate research design for a research proposal.
4. Students will be able to conduct original and scholarly research on public policy issues.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 15 for assistantships	GRE, GMAT, MAT or LSAT
		Jan 30 final date for admission consideration	International applicants TOEFL

Special requirements

- Master's degree, J.D. or M.D. from an accredited university. Graduate assistantships are only awarded for fall admission. For students wishing to be considered for a limited number of fellowships, materials must be received no later than Dec. 15. Spring admissions are considered exceptions and will be considered on a case-by-case basis.

Admission is open to qualified persons without regard to age, physical disability, national origin, race, religion or gender. Admission is competitive. The admission process is intended to assure a reasonable fit between the student's professional and research interests and faculty expertise. Consequently, otherwise qualified applicants may be denied admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the program must hold a master's degree or a recognized post-baccalaureate degree in one of the professions such as law or medicine from an accredited institution of higher education. A standardized test score, fewer than five years old, is required. Accepted examinations include the Graduate Record Examination, the Graduate Management Admissions Test, the Miller Analogies Test and the Law School Admissions Test and the Test of English as a Foreign Language for international students. Professional experience is not required, but is considered desirable.

In order to apply for admission to the Ph.D. in Public Policy and Administration program, prospective students must submit:

1. A VCU application for graduate study
2. Transcripts from all previous colleges or universities
3. Scores from a standardized examination (GRE, GMAT, MAT or LSAT and TOEFL for international students)
4. Three letters of reference
5. A personal statement describing reasons for applying to the program
6. A current professional resume

Admission standards

Applicants are evaluated based on the entire admission package; however, the following provides some guidelines for a competitive application.

1. Cumulative minimum GPA of 3.6 (on a four-point scale) or equivalent for graduate-level work
2. Standardized examination scores less than five years old (GRE preferred)
3. Three references – a minimum of one academic recommendation attesting to the applicant's ability to succeed in doctoral-level work
4. Personal statement, resume, curriculum vitae that:
   a. Clearly articulates the applicant's academic research interests whereby a decision can be made as to the applicant's "fit" with the program
   b. Shows a clear indication of a faculty match and expertise for the applicant's research interests
   c. Displays enthusiasm for the field of public policy and administration
   d. Is well-written and error-free
5. All students admitted to the program must have completed prior to admission, or are required to complete during the first year, the following graduate-level courses (or their equivalents):
   a. Research methods (equivalent of PADM 623/GVPA 623/CRJS 623/URSP 623)
   b. Statistics (equivalent of PADM 624)
   c. Public policy, economics or administration/management

The primary admission deadline is Jan. 30 for enrollment to begin the following fall semester; however, materials must be received no later than Dec.15 from those students wishing to be considered for assistantships. A small number of special admissions may be offered (Oct.15 application deadline) for entry the following spring semester; however, these are considered on a case-by-case basis. Assistantships are only offered to those offered full-time admission in the fall. Applicants who wish to be considered for the Oct.15 deadline must include a letter requesting and justifying early admission. If the request for early consideration is not accepted, the application will be held over to the Jan. 30 application deadline for consideration for the following fall admission.

While VCU Graduate School policy allows up to six credit hours of course work to be taken as a nondegree-seeking student prior to formal admission, taking such courses in no way guarantees admission to the program. Also, transfer credit hours are only considered for elective courses. Core courses must be taken at VCU.

Application information is available from the L. Douglas Wilder School of Government and Public Affairs Office of Graduate Advising or the Graduate Admissions Office. International applicant information and materials are available from International Admissions (http://international.admissions.vcu.edu).

Degree requirements

The doctoral program is structured around a core curriculum and four areas of concentration. The curriculum is designed to provide a sound intellectual foundation for the pursuit of scholarly research in areas of public policy, urban and regional policy, public administration and criminal justice policy. Students will select a concentration after the first year of study and after passing the comprehensive examination.

In addition to general VCU Graduate School graduation requirements (p. 31), students take a minimum of 45 graduate credit hours of course work and dissertation research in addition to any prerequisites that might be necessary. Five of these courses are part of the core, and at least four are concentration courses. The remaining three electives are to be taken outside the concentration with additional methodology courses highly recommended. Required courses generally will be available on an evening or weekend schedule.

Course work in the Ph.D. program has a strong orientation toward research, both applied and theoretical. Where appropriate, course work may be linked to funded university projects or to external agency-based analytical work. Courses emphasize research, writing and presentation skills.

All students must take a comprehensive qualifying examination on the core course requirements and a written or oral comprehensive examination in the concentration and must be approved by the VCU Graduate School for degree candidacy before beginning work on their dissertations.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PPAD 711	Seminar in Public Policy I	3
PPAD 712	Seminar in Public Policy II	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Total Hours		15

Public administration concentration

Course	Title	Hours
Concentration courses		
PPAD 740	Seminar in Public Management	3
PPAD 741	Advanced Theory in Public Administration	3
Select six credits from the following:		6
GVPA 672	Social Equity and Public Policy Analysis	
PADM 630	Strategic Planning and Management in the Public Sector	
PADM 650	Principles of Nonprofit Management	
PADM 654	Program Design and Evaluation in the Nonprofit Sector	
PADM 680	Executive Leadership Seminar	
PADM 681	Governmental Administrative Decision-making Processes	
PPAD 715	U.S. Political Processes and Institutions	
PPAD 716	Public Policy Economics	
PPAD 717	Law and Public Policy	
PPAD 723	Survey Research Methods	
PPAD 726	Advanced Research Design	
PPAD 791	Topical Seminar	
PPAD 792	Independent Study	
Total Hours		12

Electives outside of the concentration

Students will take at least three elective courses outside the concentration with the approval of their advisers. Students may take courses at the 500-level or higher from other Ph.D. concentration areas (as listed under each concentration) and other programs such as homeland security, criminal justice, public administration and urban and regional planning within the Wilder School. In addition, students may choose elective courses from among the following 3-credit courses:

Course	Title	Hours
Select three of the following:		9
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
EDUS 711	Qualitative Methods and Analysis	
ENGL 661	Themes in Interdisciplinary Studies	
EPID 603	Public Health Policy and Politics	
GSWS 602	Feminist Research Epistemology and Methods	
GSWS 622	Women and Public Policy	
HADM 763	Applied Health Services Research	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
INTL/NURS 514	International Perspectives on Community Health in Developing Countries	
MASC 613	Mass Media and Society	
MATX 601	Texts and Textuality	
NURS 770	Quantitative Research	
NURS 772	Qualitative Research	
OPER/STAT 636	Machine Learning Algorithms	
STAT 543	Statistical Methods I	
STAT 544	Statistical Methods II	
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	
SWKD 705	Multivariate Analysis in Social Work and Human Services Research	
Total Hours		9

Dissertation research

Course	Title	Hours
PPAD 898	Dissertation Research (minimum nine credits)	9

Total graduate credit hours required (minimum) 45

Qualifying examinations

After completing all of the core courses in the Ph.D. program, each student takes a **comprehensive qualifying examination on the core.** The examination is designed to evaluate the mastery students have achieved over the body of knowledge represented by the core. It is intended to measure the ability of students to organize, integrate and creatively apply the knowledge in the field to important problems. Although organized

around the courses in the core, the examination is not restricted to material covered in those courses. It is expected that doctoral students will read well beyond the confines of individual courses.

In order to continue in the program, students must attempt the qualifying examination no later than the next regular semester following the completion of the core course requirements. They must pass the exam by the end of the second regular semester after completing the core course requirements. A student may attempt the examination twice. Examinations are offered twice per year.

A student also must take a **written or oral comprehensive examination in the concentration**. The concentration faculty will determine the form of the examination. A student may attempt the examination twice. Each student must pass this second examination before defending a dissertation proposal.

Dissertation

After completing all course work for the concentration and passing both qualifying examinations, students must prepare a dissertation involving original research that contributes to the body of knowledge in the field. A committee approved by the associate dean of the Wilder School supervises the dissertation work. The chair of the committee must be appointed as graduate faculty and be a core or affiliate faculty member of the Ph.D. program.

The first formal step in the dissertation process is the development and defense of a dissertation prospectus that frames the problem to be studied, provides background on the problem, presents a review of relevant literature and justifies the methodology to be used. The defense of the prospectus as well as the completed dissertation must be presented orally and be approved by the dissertation committee. The dissertation defense is conducted in a forum open to other students and faculty.

Sample plan of study

Year one		
Fall semester		**Hours**
PPAD 711	Seminar in Public Policy I	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 740	Seminar in Public Management	3
	Term Hours:	9
Spring semester		
PPAD 712	Seminar in Public Policy II	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 741	Advanced Theory in Public Administration	3
	Term Hours:	9
Summer semester		
Elective [2]		0-3
First comprehensive examination on the core		
	Term Hours:	0-3
Year two		
Fall semester		
PPAD 780	Synthesizing Seminar in Public Policy	3
Concentration courses or electives		6
	Term Hours:	9
Spring semester		
Concentration courses or electives		9
	Term Hours:	9
Year three		
Fall semester		
PPAD 898	Dissertation Research	3-6
Elective		3
Second comprehensive examination on the concentration		
	Term Hours:	6-9
Spring semester		
PPAD 898	Dissertation Research	3-6
Elective		0-3
	Term Hours:	3-9
	Total Hours:	45-57

1

Recommended: See concentration listings for required and elective courses.

2

Students on 12-month assistantships are required to register for a minimum of three graduate credit hours.

Total graduate credit hours required (minimum) 45

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Additional contact
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Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/pubpolicy.html (http://wilder.vcu.edu/academic/pubpolicy.html)

Public Policy and Administration, Doctor of Philosophy (Ph.D.) with a concentration in public policy

Program mission

The mission of the Ph.D. in Public Policy and Administration program is to provide students with the knowledge and skills that will enable them to conduct original and scholarly research in academic institutions, governmental agencies and public policy research institutions. The purpose of the program is to prepare students for scholarly and leadership roles in government, universities, research organizations and other settings where knowledge and research skills in public policy and administration are needed. The doctoral program is committed to accomplishing this mission by creating an intellectually vibrant atmosphere for scholarship involving an active faculty from a broad

spectrum of academic disciplines and substantial interaction with government agencies and community groups.

Program goals

1. Enable students to develop expertise in a particular area of public policy
2. Enable students to apply their knowledge and skills in order to conduct original and scholarly research

Student learning outcomes

1. Students will be able to expertly apply public policy theories, integrating relevant ideas, concepts and approaches from the humanities, social sciences, law and public administration to policy analysis, formulation and implementation.
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VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 15 for assistantships	GRE, GMAT, MAT or LSAT
		Jan 30 final date for admission consideration	International applicants TOEFL

Special requirements

- Master's degree, J.D. or M.D. from an accredited university. Graduate assistantships are only awarded for fall admission. For students wishing to be considered for a limited number of fellowships, materials must be received no later than Dec. 15. Spring admissions are considered exceptions and will be considered on a case-by-case basis.

Admission is open to qualified persons without regard to age, physical disability, national origin, race, religion or gender. Admission is competitive. The admission process is intended to assure a reasonable fit between the student's professional and research interests and faculty expertise. Consequently, otherwise qualified applicants may be denied admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the program must hold a master's degree or a recognized post-baccalaureate degree in one of the professions such as law or medicine from an accredited institution of higher education. A standardized test score, fewer than five years old, is required. Accepted examinations include the Graduate Record Examination, the Graduate Management Admissions Test, the Miller Analogies Test and the Law School Admissions Test and the Test of English as a Foreign Language for international students. Professional experience is not required, but is considered desirable.

In order to apply for admission to the Ph.D. in Public Policy and Administration program, prospective students must submit:

1. A VCU application for graduate study
2. Transcripts from all previous colleges or universities

3. Scores from a standardized examination (GRE, GMAT, MAT or LSAT and TOEFL for international students)
4. Three letters of reference
5. A personal statement describing reasons for applying to the program
6. A current professional resume

Admission standards

Applicants are evaluated based on the entire admission package; however, the following provides some guidelines for a competitive application.

1. Cumulative minimum GPA of 3.6 (on a four-point scale) or equivalent for graduate-level work
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   a. Clearly articulates the applicant's academic research interests whereby a decision can be made as to the applicant's "fit" with the program
   b. Shows a clear indication of a faculty match and expertise for the applicant's research interests
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5. All students admitted to the program must have completed prior to admission, or are required to complete during the first year, the following graduate-level courses (or their equivalents):
   a. Research methods (equivalent of PADM 623/GVPA 623/CRJS 623/URSP 623)
   b. Statistics (equivalent of PADM 624)
   c. Public policy, economics or administration/management

The primary admission deadline is Jan. 30 for enrollment to begin the following fall semester; however, materials must be received no later than Dec.15 from those students wishing to be considered for assistantships. A small number of special admissions may be offered (Oct.15 application deadline) for entry the following spring semester; however, these are considered on a case-by-case basis. Assistantships are only offered to those offered full-time admission in the fall. Applicants who wish to be considered for the Oct.15 deadline must include a letter requesting and justifying early admission. If the request for early consideration is not accepted, the application will be held over to the Jan. 30 application deadline for consideration for the following fall admission.

While VCU Graduate School policy allows up to six credit hours of course work to be taken as a nondegree-seeking student prior to formal admission, taking such courses in no way guarantees admission to the program. Also, transfer credit hours are only considered for elective courses. Core courses must be taken at VCU.

Application information is available from the L. Douglas Wilder School of Government and Public Affairs Office of Graduate Advising or the Graduate Admissions Office. International applicant information and materials are available from International Admissions (http://international.admissions.vcu.edu).

Degree requirements

The doctoral program is structured around a core curriculum and four areas of concentration. The curriculum is designed to provide a sound intellectual foundation for the pursuit of scholarly research in areas of public policy, urban and regional policy, public administration and criminal justice policy. Students will select a concentration after the first year of study and after passing the comprehensive examination.

In addition to general VCU Graduate School graduation requirements (p. 31), students take a minimum of 45 graduate credit hours of course work and dissertation research in addition to any prerequisites that might be necessary. Five of these courses are part of the core, and at least four are concentration courses. The remaining three electives are to be taken outside the concentration with additional methodology courses highly recommended. Required courses generally will be available on an evening or weekend schedule.

Course work in the Ph.D. program has a strong orientation toward research, both applied and theoretical. Where appropriate, course work may be linked to funded university projects or to external agency-based analytical work. Courses emphasize research, writing and presentation skills.

All students must take a comprehensive qualifying examination on the core course requirements and a written or oral comprehensive examination in the concentration and must be approved by the VCU Graduate School for degree candidacy before beginning work on their dissertations.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PPAD 711	Seminar in Public Policy I	3
PPAD 712	Seminar in Public Policy II	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Total Hours		15

Public policy concentration

Course	Title	Hours
Concentration courses (required)		
PPAD 716	Public Policy Economics	3
PPAD 717	Law and Public Policy	3
Concentration electives		
Select six credits from the following:		6
GVPA 672	Social Equity and Public Policy Analysis	
PPAD 715	U.S. Political Processes and Institutions	
PPAD 723	Survey Research Methods	
PPAD 726	Advanced Research Design	
PPAD 730	Seminar in Health Policy	
PPAD 740	Seminar in Public Management	
PPAD 741	Advanced Theory in Public Administration	
PPAD 791	Topical Seminar	

PPAD 792	Independent Study	
Graduate-level courses in other PPAD concentration areas		
Total Hours		12

Electives outside of the concentration

Students will take at least three elective courses outside the concentration with the approval of their advisers. Students may take courses at the 500-level or higher from other Ph.D. concentration areas (as listed under each concentration) and other programs such as homeland security, criminal justice, public administration and urban and regional planning within the Wilder School. In addition, students may choose elective courses from among the following 3-credit courses:

Course	Title	Hours
Select three of the following:		9
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
EDUS 711	Qualitative Methods and Analysis	
ENGL 661	Themes in Interdisciplinary Studies	
EPID 603	Public Health Policy and Politics	
GSWS 602	Feminist Research Epistemology and Methods	
GSWS 622	Women and Public Policy	
HADM 763	Applied Health Services Research	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
INTL/NURS 514	International Perspectives on Community Health in Developing Countries	
MASC 613	Mass Media and Society	
MATX 601	Texts and Textuality	
NURS 770	Quantitative Research	
NURS 772	Qualitative Research	
OPER/STAT 636	Machine Learning Algorithms	
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	
SWKD 705	Multivariate Analysis in Social Work and Human Services Research	
Total Hours		9

Dissertation research

Course	Title	Hours
PPAD 898	Dissertation Research (minimum nine credits)	9

Total graduate credit hours required (minimum) 45

Qualifying examinations

After completing all of the core courses in the Ph.D. program, each student takes a **comprehensive qualifying examination on the core.** The examination is designed to evaluate the mastery students have achieved over the body of knowledge represented by the core. It is intended to measure the ability of students to organize, integrate and creatively apply the knowledge in the field to important problems. Although organized around the courses in the core, the examination is not restricted to material covered in those courses. It is expected that doctoral students will read well beyond the confines of individual courses.

In order to continue in the program, students must attempt the qualifying examination no later than the next regular semester following the completion of the core course requirements. They must pass the exam by the end of the second regular semester after completing the core course requirements. A student may attempt the examination twice. Examinations are offered twice per year.

A student also must take a **written or oral comprehensive examination in the concentration**. The concentration faculty will determine the form of the examination. A student may attempt the examination twice. Each student must pass this second examination before defending a dissertation proposal.

Dissertation

After completing all course work for the concentration and passing both qualifying examinations, students must prepare a dissertation involving original research that contributes to the body of knowledge in the field. A committee approved by the associate dean of the Wilder School supervises the dissertation work. The chair of the committee must be appointed as graduate faculty and be a core or affiliate faculty member of the Ph.D. program.

The first formal step in the dissertation process is the development and defense of a dissertation prospectus that frames the problem to be studied, provides background on the problem, presents a review of relevant literature and justifies the methodology to be used. The defense of the prospectus as well as the completed dissertation must be presented orally and be approved by the dissertation committee. The dissertation defense is conducted in a forum open to other students and faculty.

Sample plan of study

Year one		
Fall semester		**Hours**
PPAD 711	Seminar in Public Policy I	3
PPAD 717	Law and Public Policy [1]	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
	Term Hours:	9
Spring semester		
PPAD 712	Seminar in Public Policy II	3
PPAD 716	Public Policy Economics [1]	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
	Term Hours:	9
Summer semester		
Electives [2]		variable
Other optional courses		variable
	Term Hours:	0
Year two		
Fall semester		

PPAD 780	Synthesizing Seminar in Public Policy	3
Concentration courses		6
First comprehensive examination on the core		
	Term Hours:	9
Spring semester		
Concentration courses and electives		variable
	Term Hours:	0
Year three		
Fall semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
Second comprehensive examination on the concentration		
Electives		variable
	Term Hours:	1-12
Spring semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
	Term Hours:	1-12
	Total Hours:	29-51

[1]

Recommended: See concentration listings for required and elective courses.

[2]

Students on 12-month assistantships are required to register for a minimum of three graduate credit hours.

Total graduate credit hours required (minimum) 45

Graduate program director
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Additional contact
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Program website: wilder.vcu.edu/academic/pubpolicy.html (http://wilder.vcu.edu/academic/pubpolicy.html)

Public Policy and Administration, Doctor of Philosophy (Ph.D.) with a concentration in urban and regional policy

Program mission

The mission of the Ph.D. in Public Policy and Administration program is to provide students with the knowledge and skills that will enable them to conduct original and scholarly research in academic institutions, governmental agencies and public policy research institutions. The purpose of the program is to prepare students for scholarly and leadership roles in government, universities, research organizations and other settings where knowledge and research skills in public policy and administration are needed. The doctoral program is committed to accomplishing this mission by creating an intellectually vibrant atmosphere for scholarship involving an active faculty from a broad spectrum of academic disciplines and substantial interaction with government agencies and community groups.

Program goals

1. Enable students to develop expertise in a particular area of public policy
2. Enable students to apply their knowledge and skills in order to conduct original and scholarly research

Student learning outcomes

1. Students will be able to expertly apply public policy theories, integrating relevant ideas, concepts and approaches from the humanities, social sciences, law and public administration to policy analysis, formulation and implementation.
2. Students will be able to demonstrate mastery of a particular area of public policy.
3. Students will be able to formulate appropriate research questions related to public policy and apply methodological knowledge to develop an appropriate research design for a research proposal.
4. Students will be able to conduct original and scholarly research on public policy issues.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Dec 15 for assistantships	GRE, GMAT, MAT or LSAT
		Jan 30 final date for admission consideration	International applicants TOEFL

Special requirements

- Master's degree, J.D. or M.D. from an accredited university. Graduate assistantships are only awarded for fall admission. For students wishing to be considered for a limited number of fellowships, materials must be received no later than Dec. 15. Spring admissions are considered exceptions and will be considered on a case-by-case basis.

Admission is open to qualified persons without regard to age, physical disability, national origin, race, religion or gender. Admission is competitive. The admission process is intended to assure a reasonable fit between the student's professional and research interests and faculty expertise. Consequently, otherwise qualified applicants may be denied admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants to the program must hold a master's degree or a recognized post-baccalaureate degree in one of the professions such as law or medicine from an accredited institution of higher education. A standardized test score, fewer than five years old, is required. Accepted examinations include the Graduate Record Examination, the Graduate Management Admissions Test, the Miller Analogies Test and the Law School Admissions Test and the Test of English as a Foreign Language for international students. Professional experience is not required, but is considered desirable.

In order to apply for admission to the Ph.D. in Public Policy and Administration program, prospective students must submit:

1. A VCU application for graduate study
2. Transcripts from all previous colleges or universities
3. Scores from a standardized examination (GRE, GMAT, MAT or LSAT and TOEFL for international students)
4. Three letters of reference
5. A personal statement describing reasons for applying to the program
6. A current professional resume

Admission standards

Applicants are evaluated based on the entire admission package; however, the following provides some guidelines for a competitive application.

1. Cumulative minimum GPA of 3.6 (on a four-point scale) or equivalent for graduate-level work
2. Standardized examination scores less than five years old (GRE preferred)
3. Three references – a minimum of one academic recommendation attesting to the applicant's ability to succeed in doctoral-level work
4. Personal statement, resume, curriculum vitae that:
   a. Clearly articulates the applicant's academic research interests whereby a decision can be made as to the applicant's "fit" with the program
   b. Shows a clear indication of a faculty match and expertise for the applicant's research interests
   c. Displays enthusiasm for the field of public policy and administration
   d. Is well-written and error-free
5. All students admitted to the program must have completed prior to admission, or are required to complete during the first year, the following graduate-level courses (or their equivalents):
   a. Research methods (equivalent of PADM 623/GVPA 623/CRJS 623/URSP 623)
   b. Statistics (equivalent of PADM 624)
   c. Public policy, economics or administration/management

The primary admission deadline is Jan. 30 for enrollment to begin the following fall semester; however, materials must be received no later than Dec.15 from those students wishing to be considered for assistantships. A small number of special admissions may be offered (Oct.15 application deadline) for entry the following spring semester; however, these are considered on a case-by-case basis. Assistantships are only offered to those offered full-time admission in the fall. Applicants who wish to be considered for the Oct.15 deadline must include a letter requesting and justifying early admission. If the request for early consideration is not accepted, the application will be held over to the Jan. 30 application deadline for consideration for the following fall admission.

While VCU Graduate School policy allows up to six credit hours of course work to be taken as a nondegree-seeking student prior to formal admission, taking such courses in no way guarantees admission to the program. Also, transfer credit hours are only considered for elective courses. Core courses must be taken at VCU.

Application information is available from the L. Douglas Wilder School of Government and Public Affairs Office of Graduate Advising or the Graduate Admissions Office. International applicant information and materials are available from International Admissions (http://international.admissions.vcu.edu).

Degree requirements

The doctoral program is structured around a core curriculum and four areas of concentration. The curriculum is designed to provide a sound intellectual foundation for the pursuit of scholarly research in areas of public policy, urban and regional policy, public administration and criminal justice policy. Students will select a concentration after the first year of study and after passing the comprehensive examination.

In addition to general VCU Graduate School graduation requirements (p. 31), students take a minimum of 45 graduate credit hours of course work and dissertation research in addition to any prerequisites that might be necessary. Five of these courses are part of the core, and at least four are concentration courses. The remaining three electives are to be taken outside the concentration with additional methodology courses highly recommended. Required courses generally will be available on an evening or weekend schedule.

Course work in the Ph.D. program has a strong orientation toward research, both applied and theoretical. Where appropriate, course work may be linked to funded university projects or to external agency-based analytical work. Courses emphasize research, writing and presentation skills.

All students must take a comprehensive qualifying examination on the core course requirements and a written or oral comprehensive examination in the concentration and must be approved by the VCU Graduate School for degree candidacy before beginning work on their dissertations.

Curriculum requirements

Core courses (required)

Course	Title	Hours
PPAD 711	Seminar in Public Policy I	3
PPAD 712	Seminar in Public Policy II	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
PPAD 780	Synthesizing Seminar in Public Policy	3
Total Hours		15

Urban planning and policy concentration

Course	Title	Hours
Concentration courses (required)		
PPAD 716	Public Policy Economics	3
PPAD 750	Seminar in Urban Policy	3
Concentration electives		
Select six credits from the following:		6
PPAD 791	Topical Seminar	
URSP/GVPA 632	Planning Theory and Processes	
URSP 637	Sustainable Community Development	
URSP 643	Housing Policy	
URSP 651	Transportation Policy and Planning	
URSP 655	Environmental Policy and Planning	
URSP 664	Urban Economic Development Policy	
URSP 672	Food Systems, Rural Development and Landscape Conservation	
URSP 681	International Urban Policy and Planning	
Total Hours		12

Electives outside of the concentration

Students will take at least three elective courses outside the concentration with the approval of their advisers. Students may take courses at the 500-level or higher from other Ph.D. concentration areas (as listed under each concentration) and other programs such as homeland security, criminal justice, public administration and urban and regional planning within the Wilder School. In addition, students may choose elective courses from among the following three-credit courses:

Course	Title	Hours
Select three of the following:		9
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
ECON 501	Introduction to Econometrics	
ECON 612	Econometrics	
ECON 641	Econometric Time-series Analysis	
ECON 642	Panel and Nonlinear Methods in Econometrics	
EDUS 711	Qualitative Methods and Analysis	
ENGL 661	Themes in Interdisciplinary Studies	
EPID 603	Public Health Policy and Politics	
GSWS 602	Feminist Research Epistemology and Methods	
GSWS 622	Women and Public Policy	
HADM 763	Applied Health Services Research	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
INTL/NURS 514	International Perspectives on Community Health in Developing Countries	
MASC 613	Mass Media and Society	
MATX 601	Texts and Textuality	
NURS 770	Quantitative Research	
NURS 772	Qualitative Research	
OPER/STAT 636	Machine Learning Algorithms	
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	
SWKD 705	Multivariate Analysis in Social Work and Human Services Research	
Total Hours		9

Dissertation research nine (minimum)

Course	Title	Hours
PPAD 898	Dissertation Research (minimum nine credits)	9

Total graduate credit hours required (minimum) 45

Qualifying examinations

After completing all of the core courses in the Ph.D. program, each student takes a **comprehensive qualifying examination on the core.** The examination is designed to evaluate the mastery students have achieved

over the body of knowledge represented by the core. It is intended to measure the ability of students to organize, integrate and creatively apply the knowledge in the field to important problems. Although organized around the courses in the core, the examination is not restricted to material covered in those courses. It is expected that doctoral students will read well beyond the confines of individual courses.

In order to continue in the program, students must attempt the qualifying examination no later than the next regular semester following the completion of the core course requirements. They must pass the exam by the end of the second regular semester after completing the core course requirements. A student may attempt the examination twice. Examinations are offered twice per year.

A student also must take a **written or oral comprehensive examination in the concentration**. The concentration faculty will determine the form of the examination. A student may attempt the examination twice. Each student must pass this second examination before defending a dissertation proposal.

Dissertation

After completing all course work for the concentration and passing both qualifying examinations, students must prepare a dissertation involving original research that contributes to the body of knowledge in the field. A committee approved by the associate dean of the Wilder School supervises the dissertation work. The chair of the committee must be appointed as graduate faculty and be a core or affiliate faculty member of the Ph.D. program.

The first formal step in the dissertation process is the development and defense of a dissertation prospectus that frames the problem to be studied, provides background on the problem, presents a review of relevant literature and justifies the methodology to be used. The defense of the prospectus as well as the completed dissertation must be presented orally and be approved by the dissertation committee. The dissertation defense is conducted in a forum open to other students and faculty.

Sample plan of study

Year one		
Fall semester		**Hours**
PPAD 711	Seminar in Public Policy I	3
PPAD 717	Law and Public Policy [1]	3
PPAD 721	Survey of Applied Research Methods in Public Policy	3
	Term Hours:	9
Spring semester		
PPAD 712	Seminar in Public Policy II	3
PPAD 716	Public Policy Economics [1]	3
PPAD 722	Survey of Data Analysis Techniques in Public Policy	3
	Term Hours:	9
Summer semester		
Electives [2]		variable
Other optional courses		variable
	Term Hours:	0
Year two		
Fall semester		
PPAD 780	Synthesizing Seminar in Public Policy	3
Concentration courses		6
First comprehensive examination on the core		
	Term Hours:	9
Spring semester		
Concentration courses and electives		variable
	Term Hours:	0
Year three		
Fall semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
Second comprehensive examination on the concentration		
Electives		variable
	Term Hours:	1-12
Spring semester		
PPAD 898	Dissertation Research (variable credit hours)	1-12
	Term Hours:	1-12
	Total Hours:	29-51

1

Recommended: See concentration listings for required and elective courses.

2

Students on 12-month assistantships are required to register for a minimum of three graduate credit hours.

Total graduate credit hours required (minimum) 45

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Additional contact
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Director of graduate studies
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Phone: (804) 827-1430

Program website: wilder.vcu.edu/academic/pubpolicy.html (http://wilder.vcu.edu/academic/pubpolicy.html)

Sustainability Planning, Certificate in (Post-baccalaureate graduate certificate)

Program mission

The mission of the Certificate in Sustainability Planning is to provide students with a better understanding of society's land use and natural resource systems, with a particular emphasis on the factors that contribute to or constrain their level of sustainability. The program aims to give students the knowledge and skills needed to identify and address barriers to sustainability and to formulate strategies to create more sustainable practices, systems and institutions. Using a holistic and integrated approach, the program emphasizes the interdependence of sociocultural, biophysical and political-economic dimensions of

sustainability, especially as they relate to urban or other subnational regions.

An important theme of the program is that sustainability planning is primarily about influencing humans and their activities by modifying organizational structures, economic policies and legislative frameworks. Therefore, of paramount importance are topics normally associated with the social sciences, such as urban and regional planning, economics, political science and human geography. However, sustainability is an interdisciplinary science, and thus students must also examine topics typically linked to the biophysical sciences, such as ecology and geomorphology.

Students will acquire knowledge and skills that complement backgrounds in engineering, environmental and social sciences, business or other fields.

Program goals

1. Provide students with a better understanding of the sociocultural, biophysical and political-economic dimensions of the key problems faced by society with regard to natural resources and the environment — particularly in the context of urban and other subnational regions.
2. Develop students' insights on the underlying causes of these problems and on the political-economic and sociocultural factors that constrain the ability to address them more effectively.
3. Help student acquire the analytical and professional skills needed to identify and address barriers to sustainability and to formulate strategies to develop more sustainable lifestyles, systems and institutions.

Student learning outcomes

1. Students will develop a well-rounded knowledge of sustainability, with particular emphasis on the following elements:
   a. Factors influencing sustainability at the individual, household, community, regional, national and international scale
   b. Balancing environmental, economic and social objectives in decision-making
   c. The relationship between the built and natural environments and their effects on human health and well-being
   d. Linkages among consumptions/lifestyle patterns, technology, regional carrying capacity and sustainability
   e. Political-economic influences on land/resource use, community design, transportation and other human systems
   f. Energy and natural resource efficiency and conservation
   g. Renewable resource use, environmental management and landscape/habitat protection
   h. Environmental remediation
2. Students will be able to communicate clearly and effectively, using a variety of methods, to enhance the collaborative and public nature of their work.
3. Students will acquire the analytical and research skills needed to investigate a sustainability-related problem and develop strategies for addressing it.
4. Student will acquire organizational skills and knowledge of management practices frequently employed within planning and related fields.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	April 1 (Mar 1 for financial aid	
	Spring	Oct 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the prerequisites and general criteria of eligibility for admission to the sustainability planning certificate program include:

1. Completion of an official application form
2. Three letters of reference
3. Letter of intent describing interest in applying for the Certificate in Sustainability Planning
4. An official transcript showing successful completion of a baccalaureate degree or its equivalent from an accredited college or university with a minimum grade point average of 2.7 (out of 4.0) in the last 60 hours of undergraduate study

All courses in the graduate Certificate in Sustainability Planning may be applied to meet the requirement of the Master of Urban and Regional Planning degree. However, successful completion of the certificate does not guarantee admission into the M.U.R.P. degree program.

Curriculum requirements

The mission of the Certificate in Sustainability Planning is to provide students with a better understanding of society's land use and natural resource systems, with a particular emphasis on the factors that contribute to or constrain their level of sustainability. The three core courses will provide subject matter knowledge on sustainable community development, natural resources management, and environmental policy and planning. In addition, students must take one course that focuses on socioeconomic sustainability to gain knowledge on the social equity aspect of sustainability planning. The remaining electives will provide an opportunity for more in-depth knowledge and training in specific subfields within sustainability (e.g., energy, land use or food systems) or disciplines to which a sustainability approach can be applied, such as housing policy.

Degree requirements

Course	Title	Hours
Core courses		9
URSP 637	Sustainable Community Development	
URSP 650	Natural Resources and Environmental Planning	
URSP 655	Environmental Policy and Planning	
Restricted elective (social equity)		3
Select one from:		
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 641	Citizen Participation and Negotiation	
URSP 643	Housing Policy	
Restricted electives (sustainability application) [1]		6
Select two from:		
URSP 545	Sustainable Energy Policy and Planning	
URSP 621	Introduction to Geographic Information Systems	
URSP 628	Land Use Planning	
URSP 672	Food Systems, Rural Development and Landscape Conservation	
URSP 681	International Urban Policy and Planning	
Total Hours		18

[1]With approval from the program director, other 500- and 600-level courses offered within and beyond the Wilder School can fulfill the sustainability application electives requirements. The program director will review substitution requests to maintain a commitment to the specialization and general intent of the certificate.

Total graduate credit hours required (minimum) 18

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Phone: (804) 827-1430

Program website: wilder.vcu.edu/programs/urban-and-regional-studies-planning (https://wilder.vcu.edu/programs/urban-and-regional-studies-planning)

Urban and Regional Planning, Master of (M.U.R.P.)

Program accreditation
Planning Accreditation Board

Program goals

The Master of Urban and Regional Planning degree program envisions a better future by enhancing the quality of life in mature communities and regions, particularly in Virginia, but also elsewhere in the United States and abroad, through strong planning education, high-quality scholarship and professional planning practices. The goals for the program are to:

1. Create a diverse learning environment that cultivates engagement of diverse participants — both students and faculty — in the program.
2. Prepare students to be effective practitioners in a variety of planning-related organizations, especially in mature communities and regions, with competence in the preparation, presentation and implementation of professional plans and in doing planning-related work.
3. Produce scholarship that increases knowledge and understanding of sustainability and planning support systems as well as the development of innovative methodological approaches and solutions to address issues related to sustainable community development.

4. Provide useful planning services to mature communities and regions, in cooperation with private and public planners, as appropriate.

Student learning outcomes

1. Students will apply knowledge of planning and other related fields to real-world or theoretical settings.
2. Students will pose and solve urban planning problems.
3. Students will communicate effectively for professional contexts.
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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.U.R.P.	Fall	Apr 1 (Mar 1 for assistantship consideration or financial aid)	
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Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

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2. Students not meeting these requirements may be admitted to the program on a provisional basis. The provisional period shall consist of the first nine to 12 hours of designated graduate work in which all grades must be no less than B. Provisional admission does not constitute a waiver of the requirement related to a standardized test.
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All courses in the post-baccalaureate graduate Certificate in Urban Revitalization and the post-baccalaureate graduate Certificate in Geographic Information Systems may be applied to meet the requirement of the Master of Urban and Regional Planning degree. However, successful completion of either certificate does not guarantee admission into the M.U.R.P. degree program.

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1. Complete a minimum of 48 graduate credit hours plus an internship (not for credit). A core of required courses accounts for 24 of these credit hours. A capstone requirement accounts for three or six of the required 48 credit hours. The remaining 18 or 21 credit hours are electives. A minimum overall GPA of 3.0 (on a 4.0 scale) is required for receipt of the M.U.R.P. degree. In addition, students must receive a minimum grade of B for all core and capstone courses.
2. Complete either a six-credit thesis (URSP 764) or prepare a three-credit professional plan project through the professional plan course (URSP 762). Program administrators request permission to utilize the grade of PR, in addition to normal letter grades (A, B, C, D or F) in

URSP 762. This will allow students the ability to work on their plans over a more extended period of time, if necessary.

In selecting their elective courses, students may (1) opt for exposure to a wide array of planning-related subject matter (the generalist or comprehensive approach), (2) select one of the areas of specialization defined by the department's faculty (see the list that follows) or (3) develop an individualized program, focusing on one or more self-defined topics. Regardless of the approach selected, students are expected to meet regularly with their faculty advisers for discussion of their courses of study in relation to their career plans.

The following faculty-defined areas of specialization are offered by the department:

1. Community revitalization
2. Environmental planning
3. Metropolitan planning

Curriculum requirements

Course	Title	Hours
Core courses		
URSP 610	Introduction to Planning	3
URSP 622	Community Socioeconomic Analysis Using GIS	3
URSP/GVPA/PADM/URSP 623	Research Methods for Government and Public Affairs	3
URSP/GVPA 632	Planning Theory and Processes	3
URSP 635	Legal and Legislative Foundations of Planning	3
URSP 662	Foundations for Development Planning	3
URSP 761	Planning Studio	3
URSP 797	Directed Research	3
Capstone		
Select one of these two capstone options.		3 or 6
URSP 762	Professional Plan (3 credits)	
URSP 764	Thesis or Projects (6 credits)	
Electives		
Select 18 or 21 credits from the list below as appropriate.		18 or 21
Total Hours		48

Total graduate credit hours required (minimum) 48

Electives

Course	Title	Hours
URSP 502	Global Economic Change and Development	
URSP 517	Historic Preservation in Planning	
URSP 520	Park Planning	
URSP/ENVS 521	Introduction to Geographic Information Systems	
URSP 525	Site Planning and Graphics	
URSP 541	Urban Public Policy-making Processes	
URSP 545	Sustainable Energy Policy and Planning	
URSP 567	The American Suburb	
URSP 605	Urban Planning History	
URSP 611	Principles of Urban Design	
URSP 621	Introduction to Geographic Information Systems	
URSP 625	Spatial Database Management and GIS Modeling	
URSP 626	Transportation Analytics and Modeling	
URSP 627	GIS Applications in Urban Design	
URSP 628	Land Use Planning	
URSP/PADM 630	Strategic Planning and Management in the Public Sector	
URSP 637	Sustainable Community Development	
URSP 641	Citizen Participation and Negotiation	
URSP 643	Housing Policy	
URSP 647	Adaptive Reuse of Buildings	
URSP 650	Natural Resources and Environmental Planning	
URSP 651	Transportation Policy and Planning	
URSP 652	Environmental Analysis	
URSP 653	Transportation Projects	
URSP/ENVS/BIOL 654	Environmental Remote Sensing	
URSP 655	Environmental Policy and Planning	
URSP 658	Transportation Finance	
URSP 659	Transportation Project Development and Evaluation	
URSP 664	Urban Economic Development Policy	
URSP 666	Urban Commercial Revitalization	
URSP 672	Food Systems, Rural Development and Landscape Conservation	
URSP 681	International Urban Policy and Planning	
URSP 691	Topics in Urban and Regional Planning	
URSP 794	Planning Practicum Seminar	
URSP 797	Directed Research	

With the approval of the program chair, other appropriate graduate courses may be applied as electives.

Concentrations

If a student chooses to pursue a specific concentration, the concentration courses and corresponding credit hours will take the place of electives in the above list.

Internship

The internship is designed to give students practical experience in planning-related activities in an institutional context. Normally, the internship is taken during the summer between the first and second year or during the second year. Many opportunities for internship positions, as well as part- and full-time jobs in planning at all levels of government, exist within the Richmond area. Upon request, the internship requirement may be waived for students with substantial planning-related professional experience.

Sample plan of study

Year one

Semester 1		Hours
URSP 610	Introduction to Planning	3
URSP 622	Community Socioeconomic Analysis Using GIS	3

URSP 662	Foundations for Development Planning	3
Elective		3
	Term Hours:	12
Semester 2		
URSP/GVPA/PADM/CRJS 623	Research Methods for Government and Public Affairs	3
URSP 635	Legal and Legislative Foundations of Planning	3
URSP 761	Planning Studio	3
Elective		3
	Term Hours:	12
Year two		
Semester 1		
URSP 632	Planning Theory and Processes	3
URSP 797	Directed Research	3
Elective		6
	Term Hours:	12
Semester 2		
URSP 762 or URSP 764	Professional Plan or Thesis or Projects	3 or 6
Elective		6 or 9
	Term Hours:	12
	Total Hours:	48

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Urban and Regional Planning, Master of (M.U.R.P.) with a concentration in community revitalization

Program accreditation
Planning Accreditation Board

Program goals

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1. Create a diverse learning environment that cultivates engagement of diverse participants — both students and faculty — in the program.
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URSP/GVPA 632	Planning Theory and Processes	3
URSP 635	Legal and Legislative Foundations of Planning	3
URSP 662	Foundations for Development Planning	3
URSP 761	Planning Studio	3
URSP 797	Directed Research	3
Capstone		
Select one of these two capstone options.		3 or 6
URSP 762	Professional Plan (3 credits)	
URSP 764	Thesis or Projects (6 credits)	
Concentration requirements		12
Electives		6 or 9
Total Hours		48

Total graduate credit hours required (minimum) 48

Community revitalization concentration (12 credits)

Course	Title	Hours
Required concentration courses		
URSP 664	Urban Economic Development Policy	3
URSP 666	Urban Commercial Revitalization	3
Concentration electives		
Select six credit hours from the following: [1]		6
FIRE 629	Real Estate Investment Analysis	3
PADM 609	Financial Management in Government	3
PADM 650	Principles of Nonprofit Management	3
PADM 656	Fund Development for the Nonprofit Sector	3
URSP 517	Historic Preservation in Planning	3
URSP 541	Urban Public Policy-making Processes	3
URSP 611	Principles of Urban Design	3
URSP 621	Introduction to Geographic Information Systems	3
URSP 627	GIS Applications in Urban Design	3
URSP 628	Land Use Planning	3
URSP 641	Citizen Participation and Negotiation	3
URSP 643	Housing Policy	3
URSP 647	Adaptive Reuse of Buildings	3
URSP 659	Transportation Project Development and Evaluation	3
URSP 672	Food Systems, Rural Development and Landscape Conservation	3
URSP 691	Topics in Urban and Regional Planning [2]	1-3

1

With the approval of the program chair, other appropriate graduate courses may be applied toward the concentration.

2

URSP 591 or URSP 691 may be selected when the topic is related to community revitalization.

Electives

Course	Title	Hours
Select six or nine credit hours (depending on selected capstone option) from the following: [1]		6 or 9
URSP 502	Global Economic Change and Development	
URSP 517	Historic Preservation in Planning	
URSP 520	Park Planning	
URSP 521	Introduction to Geographic Information Systems	
URSP 525	Site Planning and Graphics	
URSP 545	Sustainable Energy Policy and Planning	
URSP 567	The American Suburb	
URSP 591	Special Topics in Urban and Regional Studies and Planning	
URSP 605	Urban Planning History	
URSP 611	Principles of Urban Design	
URSP 621	Introduction to Geographic Information Systems	
URSP 625	Spatial Database Management and GIS Modeling	
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URSP 645	Sustainable Energy Planning and Policy	
URSP 647	Adaptive Reuse of Buildings	
URSP 650	Natural Resources and Environmental Planning	
URSP 651	Transportation Policy and Planning	
URSP 652	Environmental Analysis	
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URSP 797	Directed Research	
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1

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Curriculum requirements

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Core courses		
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URSP 622	Community Socioeconomic Analysis Using GIS	3
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URSP 761	Planning Studio	3
URSP 797	Directed Research	3
Capstone course		
Select one of these two capstone options.		3 or 6
URSP 762	Professional Plan (3 credits)	
URSP 764	Thesis or Projects (6 credits)	
Concentration requirements		12
Electives		6 or 9
Total Hours		48

Total graduate credit hours required (minimum) 48

Environmental planning concentration

Course	Title	Hours
Required concentration courses		
URSP 650	Natural Resources and Environmental Planning	3
URSP 655	Environmental Policy and Planning	3
Concentration electives		
Select six credit hours from the following: [1]		6
URSP 520	Park Planning	
URSP 545	Sustainable Energy Policy and Planning	
URSP 591	Special Topics in Urban and Regional Studies and Planning	
URSP 628	Land Use Planning	
URSP 637	Sustainable Community Development	
URSP 652	Environmental Analysis	
URSP 654	Environmental Remote Sensing	
URSP 672	Food Systems, Rural Development and Landscape Conservation	
URSP 691	Topics in Urban and Regional Planning [2]	

1

With the approval of the program chair, other appropriate graduate courses may be applied toward the concentration.

2

URSP 591 or URSP 691 may be selected when the topic is related to environmental planning.

Electives

Course	Title	Hours
Select six or nine credit hours (depending on selected capstone option) from the following: [1]		6 or 9
URSP 502	Global Economic Change and Development	
URSP 517	Historic Preservation in Planning	
URSP 520	Park Planning	

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Program website: wilder.vcu.edu/academic/urban/grad.html (http://wilder.vcu.edu/academic/urban/grad.html)

Urban and Regional Planning, Master of (M.U.R.P.) with a concentration in metropolitan planning

Program accreditation
Planning Accreditation Board

Program goals

The Master of Urban and Regional Planning degree program envisions a better future by enhancing the quality of life in mature communities and regions, particularly in Virginia, but also elsewhere in the United States and abroad, through strong planning education, high-quality scholarship and professional planning practices. The goals for the program are to:

1. Create a diverse learning environment that cultivates engagement of diverse participants — both students and faculty — in the program.
2. Prepare students to be effective practitioners in a variety of planning-related organizations, especially in mature communities and regions, with competence in the preparation, presentation and implementation of professional plans and in doing planning-related work.
3. Produce scholarship that increases knowledge and understanding of sustainability and planning support systems as well as the development of innovative methodological approaches and solutions to address issues related to sustainable community development.
4. Provide useful planning services to mature communities and regions, in cooperation with private and public planners, as appropriate.

Student learning outcomes

1. Students will apply knowledge of planning and other related fields to real-world or theoretical settings.
2. Students will pose and solve urban planning problems.
3. Students will communicate effectively for professional contexts.
4. Students will lead effectively.
5. Students will apply the values and ethics of professional planning to their planning practices.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.U.R.P.	Fall	Apr 1 (Mar 1 for assistantship consideration or financial aid)	
	Spring	Oct 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following specifications apply:

1. Students must have a minimum 2.7 GPA (on a 4.0 scale) in their last 60 semester hours of undergraduate work. In addition, a minimum GPA of 3.0 must have been maintained in their undergraduate majors.
2. Students not meeting these requirements may be admitted to the program on a provisional basis. The provisional period shall consist of the first nine to 12 hours of designated graduate work in which all grades must be no less than B. Provisional admission does not constitute a waiver of the requirement related to a standardized test.
3. Generally, at least two of the three letters of reference should come from former faculty.

All courses in the post-baccalaureate graduate Certificate in Urban Revitalization and the post-baccalaureate graduate Certificate in Geographic Information Systems may be applied to meet the requirement of the Master of Urban and Regional Planning degree. However, successful completion of either certificate does not guarantee admission into the M.U.R.P. degree program.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students in the M.U.R.P. degree program must:

1. Complete a minimum of 48 graduate credit hours plus an internship (not for credit). A core of required courses accounts for 24 of these credit hours. A capstone requirement accounts for three or six of the required 48 credit hours. The remaining 18 or 21 credit hours consist of concentration requirements and electives. A minimum overall GPA of 3.0 (on a 4.0 scale) is required for receipt of the M.U.R.P. degree. In addition, students must receive a minimum grade of B for all core and capstone courses.
2. Complete either a six-credit thesis (URSP 764) or prepare a three-credit professional plan project through the professional plan course (URSP 762). Program administrators request permission to utilize the grade of PR, in addition to normal letter grades (A, B, C, D or F) in URSP 762. This will allow students the ability to work on their plans over a more extended period of time, if necessary.

In selecting their elective courses, students may (1) opt for exposure to a wide array of planning-related subject matter (the generalist or comprehensive approach), (2) select one of the areas of specialization

defined by the department's faculty (see the list that follows) or (3) develop an individualized program, focusing on one or more self-defined topics. Regardless of the approach selected, students are expected to meet regularly with their faculty advisers for discussion of their courses of study in relation to their career plans.

The following faculty-defined areas of specialization are offered by the department:

1. Community revitalization
2. Environmental planning
3. Metropolitan planning

Curriculum requirements

Course	Title	Hours
Core courses		
URSP 610	Introduction to Planning	3
URSP 622	Community Socioeconomic Analysis Using GIS	3
URSP/GVPA/PADM/URSP 623	Research Methods for Government and Public Affairs	3
URSP/GVPA 632	Planning Theory and Processes	3
URSP 635	Legal and Legislative Foundations of Planning	3
URSP 662	Foundations for Development Planning	3
URSP 761	Planning Studio	3
URSP 797	Directed Research	3
Capstone		3 or 6
URSP 762	Professional Plan (3 credits)	
URSP 764	Thesis or Projects (6 credits)	
Concentration requirements		12
Electives		6 or 9
Total Hours		48

Total graduate credit hours required (minimum) 48

Metropolitan planning concentration courses

Course	Title	Hours
Required concentration courses		
URSP 628	Land Use Planning	3
URSP 651	Transportation Policy and Planning	3
Concentration electives		
Select six credit hours from the following: [1]		6
FIRE 627	Real Estate Development	
URSP 520	Park Planning	
URSP 541	Urban Public Policy-making Processes	
URSP 591	Special Topics in Urban and Regional Studies and Planning [2]	
URSP 611	Principles of Urban Design	
URSP 621	Introduction to Geographic Information Systems	
URSP 625	Spatial Database Management and GIS Modeling	
URSP 626	Transportation Analytics and Modeling	
URSP 627	GIS Applications in Urban Design	
URSP 641	Citizen Participation and Negotiation	
URSP 643	Housing Policy	
URSP 659	Transportation Project Development and Evaluation	
URSP 664	Urban Economic Development Policy	
URSP 672	Food Systems, Rural Development and Landscape Conservation	
URSP 681	International Urban Policy and Planning	
URSP 691	Topics in Urban and Regional Planning [2]	

[1]

With the approval of the program chair, other appropriate graduate courses may be applied toward the concentration.

[2]

URSP 591 or URSP 691 may be selected when the topic is related to metropolitan planning.

Electives

Course	Title	Hours
Select six or nine credit hours (depending on selected capstone option) from the following: [1]		6 or 9
URSP 502	Global Economic Change and Development	
URSP 517	Historic Preservation in Planning	
URSP 520	Park Planning	
URSP 521	Introduction to Geographic Information Systems	
URSP 525	Site Planning and Graphics	
URSP 541	Urban Public Policy-making Processes	
URSP 545	Sustainable Energy Policy and Planning	
URSP 567	The American Suburb	
URSP 591	Special Topics in Urban and Regional Studies and Planning	
URSP 605	Urban Planning History	
URSP 611	Principles of Urban Design	
URSP 621	Introduction to Geographic Information Systems	
URSP 625	Spatial Database Management and GIS Modeling	
URSP 626	Transportation Analytics and Modeling	
URSP 627	GIS Applications in Urban Design	
URSP/PADM 630	Strategic Planning and Management in the Public Sector	
URSP 637	Sustainable Community Development	
URSP 641	Citizen Participation and Negotiation	
URSP 643	Housing Policy	
URSP 647	Adaptive Reuse of Buildings	
URSP 650	Natural Resources and Environmental Planning	
URSP 652	Environmental Analysis	
URSP 653	Transportation Projects	
URSP/ENVS/BIOL 654	Environmental Remote Sensing	
URSP 655	Environmental Policy and Planning	

URSP 658	Transportation Finance
URSP 659	Transportation Project Development and Evaluation
URSP 664	Urban Economic Development Policy
URSP 666	Urban Commercial Revitalization
URSP 672	Food Systems, Rural Development and Landscape Conservation
URSP 681	International Urban Policy and Planning
URSP 691	Topics in Urban and Regional Planning
URSP 794	Planning Practicum Seminar
URSP 797	Directed Research

1

With the approval of the program chair, other appropriate courses may be applied as electives.

Internship

The internship is designed to give students practical experience in planning-related activities in an institutional context. Normally, the internship is taken during the summer between the first and second year or during the second year. Many opportunities for internship positions, as well as part- and full-time jobs in planning at all levels of government, exist within the Richmond area. Upon request, the internship requirement may be waived for students with substantial planning-related professional experience.

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Director of graduate studies
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Program website: wilder.vcu.edu/academic/urban/grad.html (http://wilder.vcu.edu/academic/urban/grad.html)

Urban and Regional Planning, Master of (M.U.R.P.)/Juris Doctor (J.D.) with the University of Richmond [combined]

Program accreditation
Planning Accreditation Board

A cooperative arrangement with the University of Richmond School of Law makes it possible for students to receive a law degree (J.D.) and an urban and regional planning degree (M.U.R.P.) in four years rather than the five years ordinarily required.

The purpose of the program is to integrate the two professional curricula and to provide the expertise necessary to apply legal analytical skills and planning methods and analysis to urban and regional policy issues and problems. The dual degree program is designed to equip graduates for a variety of professional positions, including staff for legislative committees and government agencies and commissions, government legal staff, private consulting, neighborhood advocacy, directorships of planning and related agencies and executive aides to elected officials.

Refer to individual program pages for admission requirements, application deadlines, program goals, student learning outcomes, degree requirements, curriculum requirements and graduation requirements specific to the separate programs and concentrations.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Application process

Interested students must apply separately for and be admitted to the University of Richmond School of Law and the Master of Urban and Regional Planning program at VCU. Students will spend the entire first year in either the University of Richmond School of Law or the L. Douglas Wilder School of Government and Public Affairs, and the second year in the program not selected the first year. Twelve credit hours of the planning program will be applied toward meeting the graduation requirements of the law school, and 12 credit hours in the law school will be applied toward meeting requirements of the M.U.R.P. program.

Upon admission to the dual-degree program, every student will be assigned an adviser in each program who will assist in planning a course of study that will include all of the required courses in each program plus such elective courses that will best serve the interests of the individual student.

Students deciding not to complete the dual degree program must meet all of the regular requirements of either the J.D. or M.U.R.P. to receive the degree of their choice.

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Program website: wilder.vcu.edu/academic/urban/grad.html (http://wilder.vcu.edu/academic/urban/grad.html)

Urban Revitalization, Certificate in (Post-baccalaureate graduate certificate)

Program accreditation
Planning Accreditation Board

Program goal

The Certificate in Urban Revitalization provides specialized training in the techniques and processes of city and neighborhood revitalization. Topics include adaptive reuse of buildings, historic preservation, real estate market analysis and the role of private-public partnerships in financing development projects. The certificate is useful for midcareer professionals who wish to learn new skills to expand their career options. It also is useful for recent college graduates who desire advanced training beyond the baccalaureate level and accelerated entry into the job market.

At any time, students in the certificate program may apply for admission into the Master of Urban and Regional Planning program and, if accepted, may transfer the certificate credits toward partial fulfillment of the master's degree requirements.

Student learning outcomes

1. Students should display evidence of having developed a multidisciplinary understanding of urban life.
2. Students will demonstrate an understanding of, and a willingness to act in accordance with, the ethics and values of the professional.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Apr 1 (Mar 1 for financial aid)	
	Spring	Oct 1	

Special requirements

- These deadlines are designed to allow sufficient time for application review and admission processing. Applications may be submitted after the deadline; however, there is no guarantee of sufficient time for processing. Any application submitted too late for current semester processing will be considered for the following semester.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the prerequisites and general criteria of eligibility for admission to the urban revitalization certificate program include:

1. Completion of an official application form
2. Three letters of reference
3. Letter of intent describing interest in applying for the Certificate in Urban Revitalization
4. An official transcript showing successful completion of a baccalaureate degree or its equivalent from an accredited college or university with a minimum grade point average of 2.7 (out of 4.0) in the last 60 hours of undergraduate study
5. Demonstration of professional experience in planning or work related to the certificate program (The experience requirement may be waived for candidates who demonstrate professional promise.)

All courses in the graduate Certificate in Urban Revitalization may be applied to meet the requirement of the Master of Urban and Regional Planning degree. However, successful completion of the certificate does not guarantee admission into the M.U.R.P. degree program.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the Certificate in Urban Revitalization program requires 18 graduate credit hours of course work, which blends instruction in planning, urban design, economics and finance.

Curriculum requirements

Course	Title	Hours
Select six of the following:		18
FIRE 629	Real Estate Investment Analysis [1]	
URSP 517	Historic Preservation in Planning	
URSP 610	Introduction to Planning	
URSP 611	Principles of Urban Design	
URSP 643	Housing Policy	
URSP 647	Adaptive Reuse of Buildings	
URSP 664	Urban Economic Development Policy	
URSP 666	Urban Commercial Revitalization	
URSP 691	Topics in Urban and Regional Planning (architectural analysis and historical preservation)	
URSP 691	Topics in Urban and Regional Planning (historical preservation application)	
Other elective, if approved by the program chair or certificate program coordinator		
Total Hours		18

[1] Either URSP 647 or FIRE 629, but not both, may be applied toward the degree requirements.

For students who wish to focus primarily on historic preservation 12 of the program's 18 hours should include:

Course	Title	Hours
URSP 517	Historic Preservation in Planning	3
URSP 647	Adaptive Reuse of Buildings	3
URSP 691	Topics in Urban and Regional Planning (architectural analysis and historical preservation)	3
URSP 691	Topics in Urban and Regional Planning (historical preservation application)	3
Total Hours		12

Total graduate credit hours required (minimum) 18

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Program website: wilder.vcu.edu/academic/certificate/urban.html (http://wilder.vcu.edu/academic/certificate/urban.html)

SCHOOL OF MEDICINE

The School of Medicine opened on Nov. 5, 1838, as the medical department of Hampden-Sydney College, and became the Medical College of Virginia in 1854. Full-time clinical faculty members were first appointed in 1928, and improved facilities became available between 1936 and 1941 with the completion of the 600-bed West Hospital, A. D. Williams Clinic and Hunton Hall dormitory, located on the current site of the Main Hospital building. Growth in faculty, students and facilities continued after World War II, leading to the development of today's academic health center.

Hospital facilities on the MCV Campus include both in-patient and out-patient facilities. MCV Hospitals of the VCU Health System is licensed for 902 beds. In addition, the hospital at the McGuire Veterans Affairs Medical Center (600 beds) provides excellent patient care, training and research opportunities for the School of Medicine through its affiliation programs.

In the School of Medicine, advanced degree programs are coordinated through the Office of the Associate Dean for Graduate Education, who acts for the dean on all issues related to administration of advanced degree programs. Each advanced-degree program is represented by a faculty member who serves as director for graduate programs. Directors are appointed either by the chair of the department offering graduate degrees or, in the case of interdisciplinary programs, by the dean in consultation with the chairs of participating departments. The directors of graduate programs act on behalf of the programs and hold the responsibility and authority to represent the respective department(s) and their faculty to the school.

Administration

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medschool.vcu.edu (http://www.medschool.vcu.edu)

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Senior associate dean for graduate medical education

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Assistant dean for faculty development

Julie Beales, M.D.
Associate dean for veterans affairs

Diane Biskobing, M.D.
Associate dean for advancement of curriculum

Lelia Brinegar, Ed.D.
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Darrell Griffith
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Robin Hemphill, M.D.
Associate dean for patient safety and quality care

Donna Jackson, Ed.D.
Assistant dean for admissions

Tom Maness
Associate dean for alumni relations and development

Paul E. Mazmanian, Ph.D.
Associate dean for assessment and evaluation studies

Anita Navarro, Ed.D.
Chief of staff

Paul Peterson
Assistant dean for administration

Elizabeth Ripley, M.D.
Interim senior associate dean for faculty affairs

Michael Ryan, M.D.
Assistant dean for clinical medical education

Joy Sanders
Assistant dean for development and alumni affairs

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Gregory Trimble, M.D.
Assistant dean for faculty – Inova Campus

Michelle Whitehurst-Cook, M.D.
Senior associate dean for admissions

Christopher Woleben, M.D.
Associate dean for student affairs

Tom Yackel, M.D., M.P.H.
Senior associate dean for clinical affairs and president, MCV Physicians

Vacant

Assistant dean for graduate recruitment and admissions

Vacant
Associate dean for professional instruction and faculty development

Vacant
Senior associate dean for professional education programs

Accreditation

Genetic counseling (master's degree)

American Board of Genetic Counseling

Medical physics

Commission on Accreditation of Medical Physics Educational Programs

Medicine (M.D.)

Liaison Committee on Medical Education

Public health (master's degree)

Council on Education in Public Health

Mission statement

The mission of the VCU School of Medicine is to provide pre-eminent education to physicians and scientists in order to improve the quality of health care for humanity. Through innovative, scholarly activity and a diverse educational context, the school seeks to create and apply new knowledge and to provide and continuously improve systems of medical and science education. Furthermore, the mission includes the development of more effective health care practices to address the needs of diverse populations and to provide distinguished leadership in the advancement of medicine and science.

The primary aim of the School of Medicine is to provide an academic environment appropriate for the education of its students, including undergraduate medical students, advanced-degree (graduate) students and graduate physician house officers, as well as continuing education directed toward the needs of practicing physicians. In the classroom, laboratory, clinic and hospital, the faculty and students are brought together in teaching-learning experiences that promote scientific scholarship and personal growth in knowledge and professional skills applicable to careers in a diverse workplace environment.

The School of Medicine and its faculty have vested responsibilities for the advancement of knowledge through research and for service to the community through application of skills in biomedical knowledge, health care leadership and patient care. Therefore, the school shares with teaching the interdependent and almost inseparable objectives of research and service.

The School of Medicine is located on the MCV Campus of VCU.

For comprehensive information on the School of Medicine departments, programs and faculty, please go to the school website at medschool.vcu.edu (http://www.medschool.vcu.edu).

Faculty and facilities

The School of Medicine consists of 700 full-time faculty, including affiliates, assisted by 630 residents and fellows and more than 700 clinical voluntary faculty. Programs of instruction and research are conducted on campus, at the McGuire VA Medical Center and at affiliated hospitals in an effort to expose the students to the variety of clinical disorders encountered in the eastern U.S. The School of Medicine has established a geographically separate campus at the Inova Fairfax Hospital. Each year, 24 third-year students take all their clinical clerkships at Inova Fairfax Hospital. Their fourth year elective program also is based at the Inova Fairfax Hospital.

Health policies

Virginia Commonwealth University School of Medicine requires that all medical students carry active health insurance. Health insurance benefits must be equal to or greater than those provided by the university health carrier. In addition, it is required that all students complete required immunizations within six months of matriculation and have repeat tuberculosis screening performed prior to the third-year clerkships. For details related to these policies, please visit medschool.vcu.edu (http://www.medschool.vcu.edu).

The School of Medicine requires that all students enrolled in the graduate academic programs administered by the school hold active health insurance coverage. This requirement applies to students at all degree categories: doctoral, master's and certificate. Compliance is monitored by administrative offices of the school and departments. Failure to comply with this requirement is grounds for dismissal.

Graduate programs

A complete listing of advanced degree programs including links to departments, programs, contact information and application requirements can be found at medschool.vcu.edu/audience/prospective (http://www.medschool.vcu.edu/audience/prospective).

Graduate programs offering doctoral (Ph.D.) training in the School of Medicine include:

- Biochemistry
- Biostatistics
- Epidemiology
- Healthcare policy and research
- Human genetics
- Medical physics
- Microbiology and immunology
- Neuroscience
- Pharmacology and toxicology
- Physiology
- Social and behavioral sciences

Programs offering master's-level training include:

- Addiction studies
- Anatomy and neurobiology
- Biochemistry
- Genetic counseling[1]
- Human genetics
- Medical physics
- MIcrobiology and immunology
- Neuroscience
- Pharmacology and toxicology

- Physiology and biophysics
- Public health[1]

[1]Both of these degree programs are accredited by the appropriate national organizations.

The Department of Human and Molecular Genetics offers a combined degree program that pairs the M.S. in Genetic Counseling and the Ph.D. in Human Genetics. The Division of Epidemiology in the Department of Family Medicine and Community Health offers the M.P.H. in combination with other degrees as well, including the Master of Social Work, Doctor of Pharmacy and Doctor of Medicine.

Recognizing that graduate education should prepare students for a variety of career options, and that developments in the basic sciences have expanded the breadth of scholarship, the school has developed approaches to interdisciplinary education, particularly in the areas of neuroscience, molecular biology and genetics, immunology, and structural biology.

A two-semester post-baccalaureate certificate program offering training for students seeking admission to professional school (i.e., School of Medicine, School of Dentistry) is available as the Certificate in Pre-medical Graduate Health Sciences. Certificate-level training is also offered in addiction studies and medical physics.

Application and admission to graduate programs

Application forms and instructions for applying to all graduate programs are available on the VCU Office of Admissions' Graduate Admissions website at graduate.admissions.vcu.edu/apply (http://graduate.admissions.vcu.edu/apply). International applicants should access materials at international.admissions.vcu.edu/apply/graduate (http://international.admissions.vcu.edu/apply/graduate).

1. The purpose of admission requirements and procedures is to ensure selection of competent students whose motivation, ability, education and character qualify them for graduate study in preparation for a career in science.
2. The following credentials constitute an application and should be sent to the VCU Office of Admissions as described on the Graduate Admissions website.
   a. Application for admission including the Application for Virginia in-state tuition
   b. Payment for the application fee
   c. Official transcripts of all undergraduate and graduate work sent directly from college or university registrars to the Graduate School
   d. Letters of recommendation from three present or former teachers or others the applicant believes to be qualified to evaluate fitness to engage in graduate study for the degree in the field of choice
   e. A personal statement from the applicant summarizing motivation, education and aims in pursuing graduate study
   f. Verbal, quantitative and analytical portions of the Graduate Record Examination (required) (Medical College Admission Test or Dental Aptitude Test may be acceptable in lieu of the GRE for selected programs.)
   g. Transcripts from all institutions of higher learning attended
   h. Program expectations for performance on the Test of English as a Foreign Language or IELTS examination for international applicants for whom English is not the native language (Please note that required academic record documents submitted in the native language must be accompanied by an official English translation. Please see the Admissions website for detailed information.)
3. Acceptance of an applicant is based upon the recommendation of the director of graduate programs of the relevant program.

While most students matriculate in the fall semester, arrangements may be made to initiate graduate work at other times during the academic year.

Ph.D. programs

Advanced graduate study leading to a Doctor of Philosophy degree is offered in the departments of Anatomy and Neurobiology, Biochemistry and Molecular Biology, Biostatistics, Family Medicine and Population Health (Epidemiology Division), Healthcare Policy and Research, Human and Molecular Genetics, Radiation Oncology (medical physics), Microbiology and Immunology, Pharmacology and Toxicology, Physiology and Biophysics, and Social and Behavioral Health, as well as an interdisciplinary neuroscience degree and molecular biology and genetics curricula in a number of disciplines.

General requirements for graduate degrees

1. All full-time graduate students are expected to register for a minimum of 15 credit hours for the fall and spring semesters and three credit hours for the summer session. This requirement includes research. As an example, when students are registered for 10 credits in formal courses, they are expected to undertake five credits of research under the direction of their adviser or any approved faculty member. Research courses shall be graded as S (satisfactory), U (unsatisfactory) or F (fail). Registration for one credit hour is permitted only with prior permission.
2. Students enrolled in all Master of Science and doctoral programs are required to receive training in the responsible conduct of research in accord with federal guidelines.
3. Students are required to remain in good academic standing through the course of their degree program. Unsatisfactory student performance includes:
   a. The assignment of a grade of U, D or F in any course
   b. Failure to maintain a cumulative GPA of 3.0 or greater
   c. Failure to pass the written or oral comprehensive examination
   d. Failure to pass the final examination

   A student whose performance is unsatisfactory must obtain the approval of the MCV Campus graduate committee to gain permission for continuing in the graduate program. The committee elicits the recommendation of the department/program (as represented by the director of graduate studies of the appropriate program) and, as appropriate, the student's adviser in making a determination. Unsatisfactory performance also constitutes grounds for the termination of financial assistance to the student.
4. Students may not take the comprehensive examination for the Ph.D. degree if their overall GPA is less than 3.0 or if the GPA for courses within the major department is below 3.0. Students may not take the final oral examination for the M.S. or Ph.D. degree if their overall GPA is below 3.0. The examining body for the administration of the comprehensive examinations and the final examination is the student advisory committee. For the oral comprehensive examination for

Ph.D. students and the final examinations for M.S. students, the body is supplemented by the addition of a representative of the MCV Campus graduate committee who chairs the examining body. The representative must be a member of the graduate faculty and is appointed by the chair of the MCV Campus graduate committee. The representative holds the responsibility for compliance with protocols appropriate to the examination, including the equitable treatment of the candidate.

5. Copies of the thesis/dissertation consistent with university standards shall be provided to the members of the student's advisory committee three weeks or more before the date of the defense of the thesis/dissertation. Following acceptance of the thesis/dissertation defense schedule by the committee, the student must submit a copy of the thesis/dissertation and a request for scheduling of the final examination to the chair of the MCV Campus graduate committee a minimum of 10 working days in advance of the examination date. After passing the final examination, it shall be the responsibility of the candidate to present to the dean's office the approved original thesis/dissertation plus the minimum required number of copies (three for M.S., four for Ph.D.) in final form suitable for binding. In consultation with the office staff, the candidate shall be responsible for the binding and the processing of the thesis through VCU Libraries and for the payment of all charges for these services.
6. A degree is granted only after all requirements have been fulfilled, including payment of all fees to the university, and after submission of the copies of the thesis for binding.
7. VCU currently requires registration for a defined credit hour level during both the didactic and research phases of advanced degree training. For programs requiring the preparation of a thesis or dissertation, there is therefore no obligatory linkage between the accumulation of credit hours and an expectation that a degree be awarded.

   As a guide to monitoring the timely completion of the degree within the present enrollment framework, the accumulation of 80 credit hours for a M.S. degree and 180 credit hours for a Ph.D. degree can be taken as a reasonable measure. These credit hour totals refer to degree programs requiring the preparation of a thesis or dissertation. Unless explicitly stated, the figures cited above apply to Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) programs offered by the School of Medicine.

Change in academic program

A student in good standing who is nearing the completion of their degree program may wish to be considered for admission to a more advanced degree administered by the School of Medicine. On more rare occasions, a student may wish to leave (withdraw) from the program in which he/she is currently enrolled and join another program at the same academic level in the School of Medicine.

In all cases the student seeking the change shall submit a hard-copy version of the VCU Application for Graduate School to the Office of Graduate Education in the School of Medicine. The one-page application must be accompanied by a letter written by the student providing the rationale for the change and the program into which the student is seeking admission. The Office of Graduate Education will review the application and the record of the student and then alert the department to the interest of the student if deemed appropriate. Students who are not making satisfactory academic progress (i.e. a student who is not in good academic standing) in a given program would not be considered candidates for a program change. In the absence of prior approval from the Office of the Dean, neither an "application" by a student directly to a program nor the "acceptance" of a student by a program will be valid. Neither students nor programs may initiate admission to a program in the School of Medicine in the absence of the approval by the Office of Graduate Education acting in consultation with the MCV Campus graduate committee.

The above applies to all changes in program (e.g. certificate level to master's, master's to Ph.D., program change at the same degree level).

The student adviser and advisory committee

Students receive guidance and counsel from the director of graduate programs for the appropriate program prior to appointment of the permanent adviser. The permanent adviser holds the primary responsibility for monitoring the development of the student in the program and providing the appropriate guidance and counsel essential to the scholarly development of the student.

An advisory committee, appointed shortly after the permanent adviser is appointed, serves as both an examining and consultative body, functioning to assist the development of the student. Committee members hold a special responsibility as a source of counsel for each student.

To fulfill these objectives, committee membership must avoid the existence or appearance of conflict of interest.

A conflict of interest is a set of circumstances that increases a risk that the judgment or actions regarding a primary interest will be or may appear to be unduly influenced by a secondary interest. In the case of service as a member of a student advisory committee, the primary interest is the independent evaluation of the performance of the student, the counsel provided to the student and adviser in the planning and implementation of the scholarly project, and the counsel provided to student and adviser to ensure satisfactory academic progress and an appropriate relationship between adviser and student. Secondary interests include personal or professional relationships with the adviser which could compromise or be seen to compromise the fulfillment of the primary interest of the individual as a member of the student advisory committee.

An individual having a formal personal relationship with the adviser can provide the appearance of a conflict of interest compromising the wholly independent participation of the individual as a committee member. Similarly, the presence of multiple members of a laboratory "team," accentuated in cases where there is employer-employee relationship of the "team" members, can raise concerns with respect to a potential conflict of interest. In addition, a committee composed largely of members of a single research operation replicates the counsel already available in group meetings and is not fully consistent with the purpose and objectives of committee appointments.

The advisory committee architecture exists for multiple reasons. The guidelines for committee composition are intended to provide a balance between expertise in a disciplinary area coupled with an interdisciplinary perspective to enrich the contributions of the committee to the evolution of the scholarly work to the benefit of student and adviser. The committee provides the framework for the "inter-rater reliability" of the evaluation of the student performance and development in achieving the degree of scholarly independence consistent with the awarding of the degree. The independence of the "raters" in establishing a collective judgment with

respect to student performance is central to the quality of the system and the perception of the evaluation process as equitable and not capricious.

For the above reasons the faculty of the School of Medicine shall avoid the proposed appointment to a student advisory committee individuals who have a personal relationship with the adviser or are members of the laboratory/research group of the adviser. The concerns articulated above also apply to the relationship of a student to an adviser. A familial or personal relationship between the two holds the potential for the perception of or actual conflict of interest with respect to the responsibility of the adviser to evaluate the performance of the student. If such a relationship exists, appointment as an adviser shall be avoided.

1. Each student shall have an adviser and an advisory committee.
2. Appointment of the adviser:
   a. The initial adviser will be the director of the graduate program or his/her designee prior to appointment of the permanent adviser.
   b. A permanent adviser shall be appointed from the graduate faculty by the chair of the MCV Campus graduate committee upon recommendation of the chair of the student's major department. Appointment should be made no later than the beginning of the fall semester following matriculation. A change in the permanent adviser may be made by the chair of the MCV Campus graduate committee upon recommendation of the chair of the major department.
3. Duties of the adviser:
   a. The adviser shall, with the student's advisory committee, have responsibility for guiding the student's academic program.
   b. The adviser shall develop a plan for the student's didactic program with the student.
   c. The adviser shall, on the basis of the proposed didactic and scholarly program for the student, identify members of the faculty to comprise the student's advisory committee and elicit their agreement to serve, the adviser serving as the chair of the committee.
   d. The adviser shall supervise the student's research work and dissertation preparation and be one of the examiners of the dissertation (Ph.D.).
   e. At the close of the spring semester, the adviser shall submit to the program director or the chair of the MCV Campus graduate committee a report covering the progress of the student. Copies of the report should be provided to the student and the membership of the student advisory committee by the adviser.
4. The student's advisory committee:
   a. The student's advisory committee shall be appointed no later than the end of the fall semester of the second year after matriculation by the chair of the MCV Campus graduate committee, upon recommendation of the student's adviser, review by the graduate program director and recommendation of the chair of the department of the permanent adviser. Appointment of the student advisory committee must be done within three months of the appointment of the permanent adviser and prior to the administration of comprehensive (or final) examinations. The composition of the advisory committee shall be such that significant areas of the student's scholarly program are represented in the expertise of the faculty members.
      i The committee for the Ph.D. candidate shall consist of a minimum of five members as follows: the student's adviser; two other members of the graduate faculty of the department/program in which the student is enrolled; and at least two other members of the graduate faculty from departments other than the one in which the student is enrolled (where feasible, from two different departments).
      ii A faculty member who is not a member of the graduate faculty may be appointed to a student advisory committee if approved by the MCV Campus graduate committee. Appointment is made by the dean of the Graduate School.
      iii The student adviser is identified as the chair of the student advisory committee.
   b. Duties of the student's advisory committee:
      i The advisory committee functions as an advisory body to ensure that timely progress toward degree completion is being achieved, as an examining body participating as appropriate for the intended degree in written qualifying examinations and conducting the oral qualifying examination and final examination, and as a consultative body to provide scholarly counsel.
      ii The student's advisory committee shall work with the student's adviser in guiding the student's graduate program and shall meet at least annually. It is strongly recommended that the advisory committee meet with the student prior to administration of the comprehensive examination(s) by the committee.
      iii The student's advisory committee shall recommend and approve a degree program (including foreign language if applicable) for the student as soon as it is practical. The proposed program should be filed with the chair of the MCV Campus graduate committee no later than the third semester of study.
      iv The student's advisory committee shall conduct the oral comprehensive and final examination.

Doctor of Philosophy

1. A minimum of 30 credit hours exclusive of research credits is generally required. In practice, a minimum of four years of study, including research, is necessary to complete all requirements.
2. For all Ph.D. programs, a period of residence of at least two consecutive semesters is required. In the context of Ph.D. training, "residence" refers to full-time enrollment, equivalent to enrollment of nine or more credit hours in a given academic term. The School of Medicine recommends that doctoral students maintain "residency" status for one academic year (fall and spring semesters), usually during the initial year of study. This recommendation is to ensure that the didactic component of training is not prolonged. Students should register in each academic term as a means of ensuring that timely progress toward degree completion is achieved. The specific requirements for residency will be detailed by the individual programs. A time limit of seven calendar years, beginning at the time of first registration, is placed on work to be credited toward the Doctor of Philosophy degree.

Admission to candidacy

The development of the individual as an independent research scientist is a critical component of the Ph.D. degree. The potential for such development is assessed on the basis of both mastery of subject matter and research competency as judged in the context of written and oral examinations administered at the level of department or program. Students are admitted to candidacy by the dean on the basis of completing examinations as required and the recommendation of

the faculty adviser, student advisory committee and graduate program director.

Individual development plan

In order to assist trainees and advisers in the efficient completion of degree training and considered identification of a strategy for career development once the degree has been awarded, all graduate students will be required to create an individual development plan. The IDP will have two components, both of which are critical to the achievement of a successful career outcome.

The first component will address the action plan for the research project over the next 12-month period. This should take a form analogous to the "Specific Aims" section of an NIH grant proposal, identifying key experimental objectives. In addition, objectives in professional development (e.g. attendance at a national meeting, delivery of a seminar) are also identified. The student adviser works with the student to develop this component of the IDP. The IDP is then used as a resource for consideration and comment by the student advisory committee in the annual meeting with the student.

The second component of the IDP will explore the long-term "career objectives" of the student. Career objectives must look beyond a period of postdoctoral training. The nature of this component of the plan will vary widely depending on the individual. For the individual who has identified a particular career position, the IDP might, for example, seek to gain a more complete understanding of the requirements of such a position or the identification of "soft" skills critical to success in the position. If undecided, the individual might explore the variety of career options for which the biomedical science degree can serve as a foundation. While the student's research adviser can play a role in developing this component of the plan, students should be encouraged to identify a mentor who can provide critical, concrete and confidential counsel to the student.

The use of the career planning tool distributed by the American Association for the Advancement of Science as "myIDP" to both guide the creation of a plan and convert entries into a report format is strongly recommended. A copy of the IDP will be submitted to the graduate program director in June of each year. The plans will be forwarded to the School of Medicine Office of Graduate Education. A record of the receipt of the IDP is placed in the student file.

Progress to degree completion

The timely completion of advanced degrees is in the best interests of the student. In order to ensure that impediments to degree completion are addressed at an early stage the Office of Graduate Education in the School of Medicine houses a record of the meetings of the student advisory committee in GradTrak. On an annual basis, programs will provide to the Office of Graduate Education a record of the date(s) on which the student advisory committee has met, a copy of the minutes of the meeting and/or the memorandum provided to the student describing the progress made to degree completion, along with the expression of compliments, concerns and corrective action as appropriate. A copy of the IDP prepared by the student accompanies the report of the actions of the student advisory committee meeting.

While recognizing that the research enterprise is subject to unknowns including unanticipated problems in the successful conduct of experiments, the duration of training should not be unduly extended as a consequence. The adviser and student advisory committee have a responsibility to ensure that the scope of the research project is such that a doctoral degree can be completed in five to six years. The student advisory committee plays a central role to ensure that the treatment of the student is equitable and that the student displays appropriate effort, commitment and development.

Advisers have an obligation to ensure that in circumstances where student performance is not deemed to be satisfactory, the presence of the potential problem is communicated to the student advisory committee and the program director. The interests of the adviser and student are best served when the evaluation of the situation is made with multiple inputs. In cases where a problem does exist, communication of the substandard performance, along with a course and timeline for remediation, should be formally communicated to the student as soon as possible. Documenting the existence of problem areas should not await the end of a semester or be delayed until a scheduled assessment is to take place.

If the student has not completed all degree requirements at the end of 15 semesters (inclusive of summer terms) of study, the adviser will provide specific information on the timeline for completion of the degree and submit to the student advisory committee and the graduate program director (with a copy forwarded to the Office of Graduate Education) for review and action if warranted.

Comprehensive examinations

In order to advance to doctoral candidacy, the student must pass both written and oral comprehensive examinations. The written examination(s) generally focus(es) on the subject matter deemed critical as a foundation in the particular program. The written examination is largely based on material covered in required course work and its application to theoretical and practical problems. The oral examination, which follows successful completion of the written examination(s), is administered to assess the ability of the candidate to integrate information and display an appropriate mastery of problem-solving capabilities.

1. To advance to candidacy, the student shall take written and oral examinations designed to determine the potential of the individual for development as an independent research scientist. Advancement to candidacy should preferably take place prior to initiating the third academic year in the program. The written examination is administered by the student's department/program. In the event of failure of the written comprehensive examination, the student, with the approval of the MCV Campus graduate committee, may be permitted to repeat the written examination.
2. After passing the written examination(s), the student is eligible for the oral examination. The oral examination is conducted by the student's advisory committee and is chaired by a graduate faculty member representing the MCV Campus graduate committee who serves as a voting member of the examining committee. The oral examination is to be administered no later than six months after passing the written examination. (Departments/programs may require a shorter interval.)
3. The oral examination is scheduled through the Office of Graduate Education. An announcement of the candidate's name, department/program and the time and place of the examination shall be posted at least 10 working days in advance of the examination. If a written document prepared by the candidate is a component of the examination, the document shall be provided to the members of the examining committee at least 10 working days in advance of the examination. The oral comprehensive examination is open to all members of the faculty. Faculty members in attendance may ask questions of the candidate, but their questions shall not be presented until after the advisory committee has completed its questions. Faculty members other than those on the advisory committee shall

not vote on the success or failure of the candidate. If a student fails the oral examination, the student may be re-examined with the approval of the MCV Campus graduate committee.

4. A favorable vote of the examining committee (all members of body being required to vote) with no more than one negative vote, is required to pass the examination. Members of the examining committee must vote on the performance as either pass or fail.
5. The oral examination must be completed successfully at least six months before submission of the dissertation.

Dissertation research

1. The student must conduct a substantial original investigation under the supervision of the permanent adviser and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge.
2. The body of experimental work to be incorporated into the dissertation is subject to the approval of the membership of the student advisory committee. The advisory committee should, therefore, be formally consulted as the research project nears completion to ensure that there is agreement with respect to the material deemed necessary and sufficient for incorporation into the dissertation. Such consultation will normally occur in the form of a meeting of the advisory committee with the student. The faculty adviser has a responsibility to advise the student when the meeting of the advisory committee for this purpose should take place.
3. The dissertation is prepared in an acceptable form and style with the counsel of the faculty adviser. The faculty adviser determines when the dissertation document can serve as the basis for the final oral examination (or dissertation defense). With the approval of the faculty adviser, the final oral examination by the advisory committee is scheduled and the dissertation document is distributed to the advisory committee. Distribution of the dissertation document to the advisory committee will usually occur at least 10 working days in advance of the final oral examination. The Office of Graduate Education is informed of the scheduling of the final oral examination 10 working days in advance of the examination. The Office of Graduate Education will then post an announcement of the final oral examination to include the name and department of the candidate together with the title of the dissertation and the day, place and time of the final oral examination.
4. The final oral examination is conducted by the student advisory committee at a specified time and place, is chaired by the faculty adviser and is open to all members of the faculty. The subject matter of the examination is limited to the content of the candidate's dissertation and related areas. A favorable vote of the advisory committee with no more than one negative vote shall be required to indicate that the candidate has passed the final oral examination. All advisory committee members must vote. The outcome of the final oral examination is reported to the Office of Graduate Education. If the examination is not passed, the student advisory committee must recommend a course of action for the student. The committee might, for example, recommend that a re-examination be scheduled, or that a major revision of the dissertation (including added data collection and/or analysis) be required prior to rescheduling of the examination, or that the student be terminated from the program or other action as deemed appropriate by the committee. A majority of the committee membership must concur in the recommended course of action. The recommendation must be communicated in writing to the appropriate graduate program director for approval within five working days of the examination. The program, acting through the graduate program director, shall accept the recommendation of the committee or determine an alternative within an additional five working days. The course of action approved by the program will be communicated in writing to the student by the graduate program director. The graduate program director shall inform the Office of Graduate Education of the School of Medicine in writing as to the action taken.

   If a re-examination is the recommended course of action, a representative of the MCV Campus graduate committee will be appointed to serve as the chair of the examining committee.
5. The student advisory committee approves the dissertation document as acceptable following the final oral examination. Approval of the dissertation as acceptable is indicated by the signature of all members of the advisory committee on the signature page of the dissertation. Approval of the dissertation by the advisory committee must be unanimous.

Termination of enrollment

The university reserves the right to terminate the enrollment of any student for unlawful, disorderly or immoral conduct or for persistent failure to fulfill the purposes for which he or she was matriculated.

A student enrolled in a graduate program under the supervision of the MCV Campus graduate committee may be dismissed from the school in which he is enrolled for failure to meet academic requirements prescribed by his school or failure to exhibit the attitudes and skills deemed necessary to function within his chosen scientific discipline.

Any action by a graduate student in a program under the supervision of the MCV Campus graduate committee considered to be unprofessional conduct shall constitute cause for disciplinary action.

Unprofessional conduct includes, but is not limited to:

1. Fraud or deceit in gaining admission to the university, i.e., false or obviously misleading representations on the admission application
2. An act that violates the established legal standards regarding conduct of one person toward society (i.e., stealing, lying, cheating and slander)
3. Conviction of a felony involving moral turpitude
4. Plagiarism or other scientific misconduct

Master's programs

Advanced graduate study leading to the Master of Science degree is offered in the departments of Anatomy and Neurobiology, Biochemistry and Molecular Biology, Biostatistics, Human and Molecular Genetics, Microbiology and Immunology, Pharmacology and Toxicology, and Physiology and Biophysics. The Department of Family Medicine and Population Health, through the Division of Epidemiology, offers the Master of Public Health degree; the Department of Human and Molecular Genetics offers the Master of Science degree in genetic counseling; and the Department of Radiation Oncology administers the Master of Science degree in medical physics.

General requirements for graduate degrees

1. All full-time graduate students are expected to register for a minimum of five credit hours for the fall and spring semesters and six credit hours for the summer session. This requirement includes research. As an example, when students are registered for 10 credits in formal courses, they are expected to undertake five credits of

research under the direction of their adviser or any approved faculty member. Research courses shall be graded as S (satisfactory), U (unsatisfactory) or F (fail). Registration for one credit hour is permitted only with prior permission.

2. Students are required to remain in good academic standing through the course of their degree program. Unsatisfactory student performance includes:
   a. The assignment of a grade of U, D or F in any course
   b. Failure to maintain a minimum cumulative GPA of 2.5
   c. Failure to pass the written or oral comprehensive examination
   d. Failure to pass the final examination

   A student whose performance is unsatisfactory must obtain the approval of the MCV Campus graduate committee to gain permission for continuing in the graduate program. The committee elicits the recommendation of the department/program (as represented by the director of graduate studies of the appropriate program) and, as appropriate, the student's adviser in making a determination. Unsatisfactory performance also constitutes grounds for the termination of financial assistance to the student.
3. Students may not take the comprehensive examination for the Ph.D. degree if their overall GPA is less than 2.5 or if the GPA for courses within the major department is below 3.0. Students may not take the final oral examination for the M.S. or Ph.D. degree if their overall GPA is below 3.0. The examining body for the administration of the comprehensive examinations and the final examination is the student advisory committee. For the oral comprehensive examination for Ph.D. students and the final examinations for M.S. students, the body is supplemented by the addition of a representative of the MCV Campus graduate committee who chairs the examining body. The representative must be a member of the graduate faculty and is appointed by the chair of the MCV Campus graduate committee. The representative holds the responsibility for compliance with protocols appropriate to the examination, including the equitable treatment of the candidate.
4. Copies of the thesis/dissertation consistent with university standards shall be provided to the members of the student's advisory committee three weeks or more before the date of the defense of the thesis/dissertation. Following acceptance of the thesis/dissertation defense schedule by the committee, the student must submit a copy of the thesis/dissertation and a request for scheduling of the final examination to the chair of the MCV Campus graduate committee a minimum of 10 working days in advance of the examination date. After passing the final examination, it shall be the responsibility of the candidate to present to the dean's office the approved original thesis/dissertation plus the minimum required number of copies (three for M.S., four for Ph.D.) in final form suitable for binding. In consultation with the office staff, the candidate shall be responsible for the binding and the processing of the thesis through VCU Libraries and for the payment of all charges for these services.
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   As a guide to monitoring the timely completion of the degree within the present enrollment framework, the accumulation of 80 credit hours for a M.S. degree and 180 credit hours for a Ph.D. degree can be taken as a reasonable measure. These credit hour totals refer to degree programs requiring the preparation of a thesis or dissertation. Unless explicitly stated, the figures cited above apply to Master of Science and Doctor of Philosophy programs offered by the School of Medicine.

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In all cases the student seeking the change shall submit a hard-copy version of the VCU Application for Graduate School to the Office of Graduate Education in the School of Medicine. The one-page application must be accompanied by a letter written by the student providing the rationale for the change and the program into which the student is seeking admission. The Office of Graduate Education will review the application and the record of the student and then alert the department to the interest of the student if deemed appropriate. Students who are not making satisfactory academic progress (i.e. a student who is not in good academic standing) in a given program would not be considered candidates for a program change. In the absence of prior approval from the Office of the Dean, neither an "application" by a student directly to a program nor the "acceptance" of a student by a program will be valid. Neither students nor programs may initiate admission to a program in the School of Medicine in the absence of the approval by the Office of Graduate Education acting in consultation with the MCV Campus graduate committee.

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student and adviser to ensure satisfactory academic progress and an appropriate relationship between adviser and student. Secondary interests include personal or professional relationships with the adviser which could compromise or be seen to compromise the fulfillment of the primary interest of the individual as a member of the student advisory committee.

An individual having a formal personal relationship with the adviser can provide the appearance of a conflict of interest compromising the wholly independent participation of the individual as a committee member. Similarly, the presence of multiple members of a laboratory "team," accentuated in cases where there is employer-employee relationship of the "team" members, can raise concerns with respect to a potential conflict of interest. In addition, a committee composed largely of members of a single research operation replicates the counsel already available in group meetings and is not fully consistent with the purpose and objectives of committee appointments.

The advisory committee architecture exists for multiple reasons. The guidelines for committee composition are intended to provide a balance between expertise in a disciplinary area coupled with an interdisciplinary perspective to enrich the contributions of the committee to the evolution of the scholarly work to the benefit of student and adviser. The committee provides the framework for the "inter-rater reliability" of the evaluation of the student performance and development in achieving the degree of scholarly independence consistent with the awarding of the degree. The independence of the "raters" in establishing a collective judgment with respect to student performance is central to the quality of the system and the perception of the evaluation process as equitable and not capricious.

For the above reasons the faculty of the School of Medicine shall avoid the proposed appointment to a student advisory committee individuals who have a personal relationship with the adviser or are members of the laboratory/research group of the adviser.

1. Each student shall have an adviser and an advisory committee.
2. Appointment of the adviser
   a. The initial adviser will be the director of the graduate program or his/her designee prior to appointment of the permanent adviser.
   b. A permanent adviser shall be appointed from the graduate faculty by the chair of the MCV Campus graduate committee upon recommendation of the chair of the student's major department. Appointment should be made no later than the beginning of the fall semester following matriculation. A change in the permanent adviser may be made by the chair of the MCV Campus graduate committee upon recommendation of the chair of the major department.
3. Duties of the adviser
   a. The adviser shall, with the student's advisory committee, have responsibility for guiding the student's academic program.
   b. The adviser shall develop a plan for the student's didactic program with the student.
   c. The adviser shall, on the basis of the proposed didactic and scholarly program for the student, identify members of the faculty to comprise the student's advisory committee and elicit their agreement to serve, the adviser serving as the chair of the committee.
   d. The adviser shall supervise the student's research work and thesis preparation and be one of the examiners of the thesis (M.S.).
   e. At the close of the spring semester, the adviser shall submit to the program director or the chair of the MCV Campus graduate committee a report covering the progress of the student. Copies of the report should be provided to the student and the membership of the student advisory committee by the adviser.
4. The student's advisory committee
   a. The student's advisory committee shall be appointed no later than the end of the fall semester of the second year after matriculation by the chair of the MCV Campus graduate committee, upon recommendation of the student's adviser, review by the graduate program director and recommendation of the chair of the department of the permanent adviser. Appointment of the student advisory committee must be done within three months of the appointment of the permanent adviser and prior to the administration of comprehensive (or final) examinations. The composition of the advisory committee shall be such that significant areas of the student's scholarly program are represented in the expertise of the faculty members.
      i The committee for the M.S. candidate shall consist of a minimum of three members as follows: the student's adviser (who serves as chair of the committee); one other member of the graduate faculty of the department/program in which the student is enrolled; and one other member of the graduate faculty from a department other than the one in which the student is enrolled.
      ii A faculty member who is not a member of the graduate faculty may be appointed to a student advisory committee if approved by the MCV Campus graduate committee. Appointment is made by the dean of the Graduate School.
   b. Duties of the student's advisory committee:
      i The advisory committee functions as an advisory body to ensure that timely progress toward degree completion is being achieved, as an examining body participating as appropriate for the intended degree in written qualifying examinations and conducting the oral qualifying examination and final examination, and as a consultative body to provide scholarly counsel.
      ii The student's advisory committee shall work with the student's adviser in guiding the student's graduate program and shall meet at least annually. It is strongly recommended that the advisory committee meet with the student prior to administration of the comprehensive examination(s) by the committee.
      iii The student's advisory committee shall recommend and approve a degree program (including foreign language if applicable) for the student as soon as it is practical. The proposed program should be filed with the chair of the MCV Campus graduate committee no later than the third semester of study.
      iv The student's advisory committee shall conduct the oral comprehensive and final examination.

Master of Science

1. A minimum of 24 semester course hours is required, exclusive of research credits. In practice, it is found that two years of study are usually necessary to complete the requirements. A time limit of five calendar years, beginning at the time of first registration, is placed on work to be credited toward the Master of Science degree. Generally a maximum of one-third of the hours required for a master's degree may be transferred from another VCU program or outside institution and applied toward the degree upon recommendation of the student's

director of graduate programs with the concurrence by the chair of the MCV Campus graduate committee.

2. Each student must conduct an original investigation under the supervision of the permanent adviser, prepare a thesis reporting the results of this research and analyze its significance in relation to existing scientific knowledge. This study is reported in a thesis prepared in acceptable form and style.
3. The body of experimental work to be incorporated into the thesis is subject to the approval of the student advisory committee members. The advisory committee should, therefore, be formally consulted as the research project nears completion to ensure that there is agreement with respect to the material deemed necessary and sufficient for incorporation into the thesis. Such consultation will normally occur in the form of a meeting of the advisory committee with the student. The faculty adviser has a responsibility to advise the student when the meeting of the advisory committee for this purpose should take place.
4. The thesis is prepared in an acceptable form and style with the counsel of the faculty adviser. The faculty adviser determines when the thesis document can serve as the basis for the final oral examination (or thesis defense). With the approval of the faculty adviser, the final oral examination by the advisory committee is scheduled and the thesis document is distributed to the advisory committee. Distribution of the thesis document to the advisory committee should take place at least 10 working days in advance of the final oral examination. The Office of Graduate Education is to be informed of the scheduling of the final oral examination 10 working days in advance of the scheduled date. The Office of Graduate Education then identifies a representative of the MCV Campus graduate committee to chair the examination, and provides an announcement of the final oral examination, which includes the name and department of the candidate together with the title of the thesis and the day, place and time of the final oral examination.
5. The final oral examination is conducted by the student advisory committee at the designated time and place and is open to the faculty. A representative of the MCV Campus graduate committee serves as the chair of the examination committee and is a voting member of the examination committee. The subject matter of the examination includes the subject matter of course work as well as the content of the thesis. A favorable vote of the advisory committee with no more than one negative vote is required to indicate that the candidate has passed the final oral examination. All members of the examination committee must vote. The outcome of the final oral examination is reported to the Office of Graduate Education. If the outcome is negative, the final oral examination may be retaken with the approval of the MCV Campus graduate committee. Advance approval is requested in writing by the department on behalf of the candidate.
6. The student advisory committee approves the thesis document as acceptable after the final oral examination has been successfully completed. Approval of the thesis as acceptable is indicated by the signature of all members of the advisory committee on the signature page of the thesis. Approval of the thesis by the advisory committee must be unanimous. A thesis is not required for completion of the Master of Genetic Counseling program. In lieu of the thesis, students in this program are required to successfully pass comprehensive oral and written examinations.

Master of Public Health

The M.P.H. degree is a generalist program that allows students to focus on research or public health practice through course electives. A minimum of four semesters of full-time study (45 credit hours) is necessary to complete the degree requirements. All M.P.H. students are required to conduct a scientific investigation on a topic relevant to human and public health. The research project is conducted under the guidance of a faculty adviser and a preceptor with expertise in the topic area. The student must prepare a report of the research and give an oral presentation to the department.

Termination of enrollment

The university reserves the right to terminate the enrollment of any student for unlawful, disorderly or immoral conduct or for persistent failure to fulfill the purposes for which he or she was matriculated.

A student enrolled in a graduate program under the supervision of the MCV Campus graduate committee may be dismissed from the school in which he is enrolled for failure to meet academic requirements prescribed by his school or failure to exhibit the attitudes and skills deemed necessary to function within his chosen scientific discipline.

Any action by a graduate student in a program under the supervision of the MCV Campus graduate committee considered to be unprofessional conduct shall constitute cause for disciplinary action.

Unprofessional conduct includes, but is not limited to:

1. Fraud or deceit in gaining admission to the university, i.e., false or obviously misleading representations on the admission application
2. An act that violates the established legal standards regarding conduct of one person toward society (i.e., stealing, lying, cheating and slander)
3. Conviction of a felony involving moral turpitude
4. Plagiarism or other scientific misconduct

MCV Campus graduate committee

The assembled directors of graduate programs and the associate dean for graduate education form the MCV Campus graduate committee, with the associate dean serving as chair of the committee. This committee holds the responsibility for ensuring appropriate administration of graduate programs, reviewing modifications of didactic courses, new course offerings and new programs, reviewing proposed modifications of program curricula to ensure maintenance of standards of quality, avoid duplication and comply with the missions of the school, and for recommending action to the dean. The committee members provide the pool of candidates from which the school representatives to the University Graduate Council are chosen.

The School of Medicine follows the policies of the Graduate School with regard to the modification of existing courses, curricula and programs as well as the introduction of new offerings. Proposals will normally come from the faculty acting through departmental bodies charged with the responsibility of monitoring academic training. In the case of offerings in interdisciplinary areas, these will normally require the input and approval of departments whose faculty and students are participants. The associate dean for graduate education in the School of Medicine may assist in the coordination of the proposal process. Proposed changes and additions are, under university guidelines, subject to review by the curriculum committee of the school. The MCV Campus

graduate committee serves as the curriculum committee for the School of Medicine. On approval by the MCV Campus graduate committee, the approval of the dean of the School of Medicine is required prior to submission to University Graduate Council for review.

For comprehensive information on the School of Medicine departments, programs and faculty, please go to the school website at medschool.vcu.edu (http://www.medschool.vcu.edu).

Monitoring satisfactory academic progress

The School of Medicine employs an electronic system given the trivial name "GradTrak" as a means of consolidating student records and the achievement of milestones in the progress to degree completion in a convenient and appropriately accessible format. Nomination and approvals of the permanent adviser and student advisory committee members are performed in this system as are the announcements of the scheduling of comprehensive and final program examinations and their outcomes. The system incorporates the continuing record of the student transcript and provides a repository for the archiving of documents associated with the matriculation of the individual as well as progress reports and other relevant documents. Access to the electronic student file is password-protected and restricted to faculty with program oversight or participation on the student advisory committee

School of Medicine registrar

The School of Medicine houses a registrar's office to meet the needs of physician trainees and alumni. Visit the School of Medicine website for more information at medschool.vcu.edu/studentaffairs/registrar (http://www.medschool.vcu.edu/studentaffairs/registrar).

Criminal background checks

All applicants to the VCU School of Medicine who receive an acceptance will have a criminal background check performed by Certiphi Screening Inc. If there is a positive finding the applicant will be notified by Certiphi first; this will allow the applicant to make corrections to the report and verify the information. If there is no change in status Certiphi will then notify VCU of their positive findings. VCU's criminal background committee will meet to discuss the applicant's Certiphi report to determine if acceptance is to be withdrawn. The school encourages full disclosure at all times on the AMCAS and supplemental applications, as dishonesty will impact the committee's decision. If an applicant has a legal finding or institutional action against them after the supplemental application is submitted they should notify the school's admissions office immediately. Once an applicant is matriculated, full disclosure is also required throughout the student's time in medical school. Criminal background checks are repeated for all students at the end of the second year and for specific program participations throughout medical school.

Addiction Studies, Certificate in (Post-baccalaureate graduate certificate) with a concentration in advanced international addiction studies

VCU, King's College London and the University of Adelaide collaborate to offer a fully online Certificate in Addiction Studies available to students around the globe. No on-campus attendance is required, and students receive a degree from all three participating universities.

Program mission

The mission of the addiction studies certificate with a concentration in advanced international addiction studies is to offer students around the world an in-depth, evidence-based, multidimensional and cross-cultural understanding of both essential and advanced topics in the field of addiction studies, including biological, psychological and public health perspectives on the etiology and treatment of addiction and evidence-based addiction policy. This will be accomplished through distance-learning technologies.

Program goals

1. Knowledge of field of addiction science: Students in the program will develop an in-depth knowledge of the field of addiction science to enhance their ability to succeed in a variety of addiction-related settings.
2. Ability to synthesize and apply advanced addiction-related knowledge: Students of the program will be able to synthesize and apply advanced addiction-related knowledge, including comparative international perspectives and approaches, to address key issues related to the treatment or prevention of addiction.
3. Understanding and application of experimental results from addiction-related research: Students will develop the ability to interpret experimental approaches and results, and apply them to address key questions in addiction science and policy, as well as conceptualize the translation from research to policy, treatment or prevention.
4. Communication skills related to addiction: Students will develop skills in communicating both core knowledge of addiction as well as the interpretation of research findings in a variety of formats.

Student learning outcomes

1. Written communication skills: The candidate will use effective written communication skills to present information related to addiction causes, interventions, treatments and policies using appropriate vocabulary, figures, tables and citations.
2. Advanced knowledge of addiction science: The student will demonstrate an advanced level of knowledge of the current elements of addiction science.
3. Familiarity and understanding of research: Students will demonstrate an advanced level of fluency with the research literature, become familiar with research methods used in addiction science and demonstrate the ability to evaluate and critique publications.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate**

School website and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 13	TOEFL

Prospective students should apply through the VCU graduate admissions portal at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu). Application to all three participating universities is accomplished through submission of the VCU graduate application. Once accepted, students are enrolled in all three universities and have access to the resources associated with all three schools. No on-campus classroom time is required to complete the degree.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have qualified in a related discipline for an honors degree (level 2A or 1) or a bachelor's degree from a recognized tertiary institution in the U.S. Any applicant who does not meet this criterion should have (in addition to an honors or bachelor's degree) significant professional work experience and approval of the program committee.
2. Have a high level of proficiency in English, demonstrated by completion of a university qualification studied in the English language, or by meeting one of the following English language requirements: an IELTS score of 7.0, a TOEFL score of 600 (paper-based) or 260 (computer-based), or a minimum grade of C in GCSE English.

Students who are enrolled in the Certificate in Addiction Studies intermediate concentration and are maintaining a minimum GPA of 3.0 may elect to change their concentration to the advanced concentration at any time during their enrollment with the permission of the program director. Students will be awarded only one certificate, however, which will reflect their highest level of attainment.

Students who have completed the Certificate in Addiction Studies intermediate concentration may also, after a period away from study, choose to apply for the advanced concentration addiction studies certificate. Students wishing to continue their studies through this mechanism may count the earlier courses toward the advanced concentration, as long as they meet all admission requirements of the Graduate School and pending surrender of the lower-level credential before being awarded the more-advanced credential. Courses taken more than four years prior to the time of the student's application will not be considered transferable and will need to be repeated.

Students completing either concentration in the Certificate in Addiction Studies may apply to the Master of Science in Addiction Studies program, also known as the International Programme in Addiction Studies and, if accepted, have their courses count toward that degree as long as they meet all admission requirements of the Graduate School. Courses taken more than four years prior to enrollment in the M.S. program will not be considered current and must be repeated.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students are required to successfully complete 24 credit hours in the six required graduate courses.

Curriculum requirements

Course	Title	Hours
IPAS 600	The Biological Basis of Addiction	4
IPAS 601	Treatment of Addiction: Psychosocial Interventions	4
IPAS 602	Public Health Issues and Approaches to Addictions	4
IPAS 603	Addiction Policy	4
IPAS 604	Treatment of Addiction: Pharmacotherapies	4
IPAS 605	Treatment of Addiction: Critical Issues	4
Total Hours		24

Total graduate credit hours (minimum) 24

Graduate program director
Mary E. Loos, Ph.D.
Associate professor, Department of Psychology
meloos@vcu.edu
(804) 828-8019

Program website: ipas.vcu.edu (http://ipas.vcu.edu)

Addiction Studies, Certificate in (Post-baccalaureate graduate certificate) with a concentration in intermediate international addiction studies

VCU, King's College London and the University of Adelaide collaborate to offer students the opportunity to complete a fully online program of study to obtain a Certificate in Addiction Studies conferred by all three universities.

Program mission

The mission of the addiction studies certificate with a concentration in intermediate international addiction studies is to offer students around the world an in-depth, evidence-based, multidimensional and cross-cultural understanding of essential topics in the field of addiction studies, including biological, psychological and public health perspectives on the etiology and treatment of addiction and evidence-based addiction policy. This will be accomplished through distance-learning technologies.

Program goals

1. Knowledge of field of addiction science: Students in the program will develop an in-depth knowledge of the field of addiction science to enhance their ability to succeed in a variety of addiction-related settings.
2. Ability to synthesize and apply advanced addiction-related knowledge: Students of the program will be able to synthesize and apply advanced addiction-related knowledge, including comparative international perspectives and approaches, to address key issues related to the treatment or prevention of addiction.
3. Understanding and application of experimental results from addiction-related research: Students will develop the ability to interpret experimental approaches and results, and apply them to address key questions in addiction science and policy, as well as conceptualize the translation from research to policy, treatment or prevention.
4. Communication skills related to addiction: Students will develop skills in communicating both core knowledge of addiction as well as the interpretation of research findings in a variety of formats.

Student learning outcomes

1. Written communication skills: The candidate will use effective written communication skills to present information related to addiction causes, interventions, treatments and policies using appropriate vocabulary, figures, tables and citations.
2. Advanced knowledge of addiction science: The student will demonstrate an advanced level of knowledge of the current elements of addiction science.
3. Familiarity and understanding of research: Students will demonstrate an advanced level of fluency with the research literature, become familiar with research methods used in addiction science and demonstrate the ability to evaluate and critique publications.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 1	TOEFL

Prospective students should apply through the VCU graduate admissions portal at graduate.admissions.vcu.edu (http://

www.graduate.admissions.vcu.edu). Application to all three participating universities is accomplished through submission of the VCU graduate application. Once accepted, students are enrolled in all three universities and have access to the resources associated with all three schools. No on-campus classroom time is required to complete the degree.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have qualified in a related discipline for an honors degree (level 2A or 1) or a bachelor's degree from a recognized tertiary institution in the U.S. Any applicant who does not meet this criterion should have (in addition to an honors or bachelor's degree) significant professional work experience and approval of the program committee.
2. Have a high level of proficiency in English, demonstrated by completion of a university qualification studied in the English language, or by meeting one of the following English language requirements: an IELTS score of 7.0, a TOEFL score of 600 (paper-based) or 260 (computer-based), or grade C or above in GCSE English.

Students who are enrolled in the Certificate in Addiction Studies intermediate concentration and are maintaining a minimum GPA of 3.0 may elect to change their concentration to the advanced concentration at any time during their enrollment with the permission of the program director. Students will be awarded only one certificate, however, which will reflect their highest level of attainment.

Students who have completed the Certificate in Addiction Studies intermediate concentration may also, after a period away from study, choose to apply for the advanced concentration addiction studies certificate. Students wishing to continue their studies through this mechanism may count the earlier courses toward the advanced concentration, as long as they meet all admission requirements of the Graduate School and pending surrender of the lower-level credential before being awarded the more-advanced credential. Courses taken more than four years prior to the time of the student's application will not be considered transferable and will need to be repeated.

Students completing either concentration in the Certificate in Addiction Studies may apply to the Master of Science in Addiction Studies program, also known as the International Programme in Addiction Studies and, if accepted, have their courses count toward that degree as long as they meet all admission requirements of the Graduate School. Courses taken more than four years prior to enrollment in the M.S. program will not be considered current and must be repeated.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students are required to successfully complete 12 credit hours in the three required graduate courses.

Curriculum requirements

Course	Title	Hours
IPAS 600	The Biological Basis of Addiction	4
IPAS 601	Treatment of Addiction: Psychosocial Interventions	4
IPAS 602	Public Health Issues and Approaches to Addictions	4
Total Hours		12

Total graduate credit hours required (minimum) 12

Graduate program director
Mary E. Loos, Ph.D.
Associate professor, Department of Psychology
meloos@vcu.edu
(804) 828-8019

Program website: ipas.vcu.edu (http://ipas.vcu.edu)

Addiction Studies, Master of Science (M.S.)

VCU, King's College London and the University of Adelaide collaborate to offer students the opportunity to complete a fully online program of study to obtain a Master of Science in Addiction Studies conferred by all three universities.

Program goal

The mission of the International Program in Addiction Studies leading to a Master of Science in Addiction Studies degree is to offer students cross-cultural exposure to the critical prevention, treatment, research and policy issues facing the field. Through a collaboration arrangement including VCU, King's College London and the University of Adelaide in Australia, students complete a program of study using distance-learning technologies to obtain the degree. The program is designed to prepare students for local, national and international policy positions, prevention/treatment program management and other leadership positions in the addictions field. This program will speed the dissemination of the latest international addictions-related knowledge, especially to remote locations around the world, and help students compare international perspectives and translate this knowledge into more effective prevention and treatment practices and evidence-based policies within their own countries.

Students in the program will:

1. Demonstrate a detailed knowledge of the field of addiction science (including comparative international policies and practices) to prepare them for leadership roles in a variety of settings (including addiction research, policy and treatment venues).
2. Be able to synthesize and apply addiction-related knowledge, including comparative international perspectives and approaches, to address key issues related to the advancement of addiction science.
3. Develop the ability to design, implement and interpret experimental approaches which address key questions in addiction science.
4. Communicate both core knowledge of addiction as well as experimental design, result and interpretation in a variety of formats.

Student learning outcomes

1. Integrated knowledge of addiction science: The student will demonstrate an appropriate level of knowledge of the current elements of addiction science as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publication.
2. Problem-solving skills: Students will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in addiction research and practice, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.

3. Research design: Students will demonstrate the achievement of an appropriate level of competence in the ability to appraise, develop and implement research studies.
4. Written communication skills: The candidate will use effective written communication skills to present information related to addiction causes, interventions, treatments and policies using appropriate vocabulary, figures, tables and citations.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	TOEFL

Prospective students should apply through the VCU graduate admissions portal at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu). Application to all three participating universities is accomplished through submission of the VCU graduate application. Once accepted, students are enrolled in all three universities and have access to the resources associated with all three schools. No on-campus classroom time is required to complete the degree.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must:

1. Have qualified in a related discipline for an honors degree (level 2A or 1) or a bachelor's degree from a recognized tertiary institution in the U.S. Any applicant who does not meet this criterion should have (in addition to an honors or bachelor's degree) significant professional work experience and approval of the program committee.
2. Have a high level of proficiency in English, demonstrated by completion of a university qualification studied in the English language, or by meeting one of the following English language requirements: an IELTS score of 7.0, a TOEFL score of 600 (paper-based) or 260 (computer-based), or minimum grade C in GCSE English.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students are required to successfully complete a minimum of 36 credit hours, which can be done either full time (12 months) or part time (24 months). Six of the required credit hours are assigned to a final research project examining a relevant addictions-related topic. VCU, King's College London and the University of Adelaide confer degrees jointly through a single diploma.

Curriculum requirements

Course	Title	Hours
IPAS 600	The Biological Basis of Addiction	4
IPAS 601	Treatment of Addiction: Psychosocial Interventions	4
IPAS 602	Public Health Issues and Approaches to Addictions	4
IPAS 603	Addiction Policy	4
IPAS 604	Treatment of Addiction: Pharmacotherapies	4
IPAS 605	Treatment of Addiction: Critical Issues	4
IPAS 606	Research Methodology in Addictions	6
IPAS 692	Research Project in Addictions	6
Total Hours		36

Total graduate credit hours (minimum) 36

Graduate program director
Mary E. Loos, Ph.D.
Associate professor, Department of Psychology
meloos@vcu.edu
(804) 828-8019

Program website: ipas.vcu.edu (http://ipas.vcu.edu)

Anatomy and Neurobiology, Master of Science (M.S.)

Program mission

The M.S. in Anatomy and Neurobiology program offers a two-year graduate curriculum of formal instructional activities and research training mentored by the members of the faculty leading to the terminal M.S. degree. The program prepares students for technical careers in neurobiological research laboratories in academic, private and government institutions. The program also provides a strong foundation for students who choose to continue onto doctoral training.

This is a research-oriented degree program comprised of graduate course work and supervised research leading to a master's thesis. The M.S. program involves approximately one year of course work and a research thesis performed under the supervision of a faculty adviser.

Program goals

1. The program is designed to provide students with the skills required to advance to positions as bioscience researchers, trainers and technicians in a broad spectrum of positions. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation/experimentation in bioscience.
2. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences. The program will prepare students to secure positions in their chosen career goals (medical school, doctoral studies, employment in academic or private laboratories).

Student learning outcomes

1. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments.
2. Communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids. The candidate will also demonstrate the achievement of an appropriate level of written communication skills with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations.
3. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems.
4. General knowledge of neurobiology and biosciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of neurobiology and the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications.
5. Employment or acceptance to advanced degree program: Degree candidates will secure positions in their chosen career goals (medical school, doctoral studies, employment in academic or private laboratories).

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to

graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT TOEFL if international

Special requirements

- Domestic students apply through the Graduate Admissions office (http://graduate.admissions.vcu.edu); international students apply through International Admissions (http://international.admissions.vcu.edu).

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. Baccalaureate degree or its equivalent at the time of enrollment with a minimum overall GPA of 3.2
2. Combined GRE scores of at least 300 for the verbal plus quantitative (1200 based on the previous scale) and 4.0 analytical score
3. Test of English as a Foreign Language examination with a minimum score of 100 (IBT), 250 (CBT) or 600 (PBT), or 6.5 on the IELTS for foreign applicants who do not use English as their native language

Although there are no absolute course requirements for admission, fundamental knowledge of general and organic chemistry and biology are considered necessary to pursue advanced studies, and upper-level courses in molecular and cellular biology are desirable. Previous research experience or demonstration of a serious interest in a research-oriented career is also desirable. A personal statement describing the applicant's research experience and interests, as well as letters of reference from previous supervisors, are necessary and helpful in determining an applicant's suitability for this curriculum. Official transcripts of all graduate and undergraduate records must be mailed from the college or university registrar.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 66 graduate credit hours. A minimum cumulative GPA of 3.0 must be maintained. Students must receive a minimum grade of B for all required courses.

A student who receives a grade of C in a required course shall repeat the course. A second grade of C in a required course shall result in dismissal from the program.

There is no expectation of the time required to complete the master's degree; usually two years of study are necessary to complete the requirements. At the appropriate time in their research, students will prepare a thesis and schedule a final oral defense of the thesis. The final oral examination (defense of the thesis) will cover the subject of the candidate's dissertation and related basic science course work.

Curriculum requirements

Required courses

Course	Title	Hours
ANAT 610	Systems Neuroscience	4
ANAT 690	Anatomy and Neurobiology Seminar (minimum four semesters)	4
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
IBMS 600	Laboratory Safety	1
NEUS 609	Cellular and Molecular Neuroscience	4
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		24

Directed research

Course	Title	Hours
ANAT 697	Directed Research (1-15 variable credit course; 42 credits minimum)	42
Total Hours		42

Total graduate credit hours required (minimum) 66

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director

Raymond J. Colello, D.Phil.
Associate professor, Department of Anatomy and Neurobiology
rcolello@vcu.edu
(804) 828-2262

Additional contact

Sharon Toussaint
Executive secretary
stoussaint@vcu.edu
(804) 828-9623

Program website: anatomy.vcu.edu (http://www.anatomy.vcu.edu)

Anatomy and Neurobiology, Master of Science (M.S.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The master's curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology or provide the foundation for further graduate study toward a Ph.D.

It is expected that the program should be completed in approximately two to two-and-one-half years.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

A master's student in the MBG curriculum must prepare a formal written research plan and make an oral presentation of their thesis research

proposal and progress report to their graduate advisory committee prior to the beginning of the second year of residency. The student's knowledge in the area of the proposed research, current research accomplishments and the feasibility of the proposed research project will be evaluated by the GAC. Successful completion of this review is required for continuance in the program and constitutes admission to candidacy.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Deadline date rolling, preference given to applications received by Jan 17	GRE; TOEFL for applicants whose native language is not English

Special requirements

- Applications for the program should be submitted to Molecular Biology and Genetics – M.S. selected from the drop-down menu of programs of the VCU online graduate application form. The degree awarded will be a Master of Science in Anatomy and Neurobiology.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned or expect to earn a baccalaureate or equivalent degree, and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics. Laboratory experience is also strongly recommended. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals. International applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the interdisciplinary master's curriculum in molecular biology and genetics requires a minimum of 48 credit hours, at least half of which must be course work restricted to graduate students. The curriculum includes19 credit hours of required core course work and 29 additional credit hours of required course work, directed research and research seminar course work, and additional approved course work, as listed below. M.S. candidates must pass a final oral examination. A written thesis approved by the student's graduate advisory committee completes the requirements leading to the M.S. degree.

Curriculum requirements

Required core courses

Course	Title	Hours
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function [1]	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism [1]	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology [1]	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics [1]	1
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (two credits taken twice) [2]	4
MICR 607	Techniques in Molecular Biology and Genetics	2
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club, must take at least once)	1
Select one of the following:		1

OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research [1]	
Total Hours		19

[1]

This requirement may also be satisfied with BIOC 503 Biochemistry, Cell and Molecular Biology (five credit hours).

[2]

This requirement may also be satisfied, under certain circumstances, with MICR 608 or MICR 609 (three credit hours; section 002). Consult with the program director.

Other required course work (29 credits)

Course	Title	Hours
Select two of the following:		
ANAT 610	Systems Neuroscience	4
NEUS 609	Cellular and Molecular Neuroscience	4
PHIS 501	Mammalian Physiology	5
PHIS 620	Ion Channels in Membranes	3
Select a minimum of one credit hour of directed research every semester of enrollment in the program after the first year of study from:		variable
ANAT 697	Directed Research	
or MICR 697	Directed Research in Microbiology	
Select a minimum of one credit hour of research seminar course work every fall and spring semester of enrollment in the program from:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG)	

Students may take additional course work with the approval of their graduate program directors.

Total graduate credit hours required (minimum) 48

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
Professor, Department of Microbiology and Immunology
christie@vcu.edu
(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Biochemistry, Doctor of Philosophy (Ph.D.)

Program goal

The Ph.D. program in biochemistry prepares students for research-oriented careers as independent scientists in academia, government and biotechnology. The core of this degree program is an original independent research project under the supervision of a faculty adviser. The Department of Biochemistry and Molecular Biology has research efforts of international stature in several areas, including cellular and molecular signaling, tumor biology, structural biology, eukaryotic molecular biology, lipid and membrane biochemistry and molecular genetics, using state-of-the-art approaches in enzymology, genomics, proteomics and lipidomics.

While emphasizing independent research in biochemistry and molecular biology and training in the responsible conduct of research, the program also provides a background of courses designed to match the needs and interests of each student. The program is designed to provide students with the skills required to advance to positions as bioscience researchers/trainers in a broad spectrum of positions. The program provides a framework for the progressive development of a mastery of the current state of the subject matter of biochemistry, cell and molecular biology, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience.

The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems.
5. General knowledge of science: The candidate will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Degree candidacy requirements

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Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs.
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. A personal statement that includes: long-term career goals to assess reasons behind the application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

Students who plan to eventually work toward the Ph.D. degree in biochemistry at VCU should apply directly to the Ph.D. program and forego the master's degree. However, applicants who are unsure if they want to earn a Ph.D. and desire experience in biomedical research before making this decision will be well-served by the M.S. program. Outstanding performance in the M.S. program can help students gain admittance to a doctoral program at VCU or elsewhere. Master's students who wish to gain admission to the Ph.D. program should submit the following documents to the graduate program director: (1) a letter making this request, which should include justification for the request, career goals, the name of a proposed Ph.D. adviser and a brief description of proposed Ph.D. research project, (2) VCU graduate transcript and (3) a letter of support from proposed Ph.D. adviser. Additional admissions requirements include (1) a grade of A in BIOC 691 (section 904: Critical Scientific Thinking), (2) a grade of A in BIOC 505 (laboratory rotation), (3) a final score in the top 50 percent of scores in BIOC 503 and BIOC 504 and (4) minimum GRE scores of 158 (verbal), 158 (quantitative) and 4.0 analytical.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/graduate/study/general-academic-regulations-graduate-students/graduation-requirements), students must complete a minimum of 60 graduate credit hours.

Ph.D. students are expected to enroll as full-time graduate students. During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Following completion of the research project and defense of the doctoral dissertation, graduates are equipped to participate in virtually any area of current biomedical research in the most prestigious laboratories.

Training in the responsible conduct of research

All Ph.D. students are required to complete the following training in the responsible conduct of research:

1. OVPR 601, OVPR 602 or OVPR 603
2. Collaborative Investigator Training Initiative: an online course that provides training in human subjects research. The course must be completed during the fall semester of year two. Students must submit the certificate of completion before starting the spring semester of year two. Consult the following link to access the course: research.vcu.edu/human_research/citi_requirements.htm (http://www.research.vcu.edu/human_research/citi_requirements.htm)
3. Animal research training: Students are required to complete an online training course for the conduct of animal subjects research. The training must be completed during the fall semester of year two. Students must submit the certificate of completion before starting the spring semester of year two. Access and guidance for the course is available through the “Animal Research” link on the Office of Research and Innovation website (https://research.vcu.edu).

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology	1-5
BIOC 504	Biochemistry, Cell and Molecular Biology	1-5
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
IBMS 620	Laboratory/Clinical Rotations (repeat for four credits)	4
IBMS 635	Cellular Signalling	3
IBMS 680	Proposal Preparation	1
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Take one or both of the following for a total of two credits.		2
BIOC 661	Critical Thinking	
or IBMS 630	Critical Thinking	

Take the following courses each fall and spring throughout the program.

BIOC 651	Biochemistry Journal Club [1, 3]	variable
BIOC 690	Biochemistry Seminar [3]	variable
BIOC 695	Biochemistry Student Seminar [3]	1

Directed research [2]

Course	Title	Hours
BIOC 697	Directed Research in Biochemistry (to be taken each fall and spring semester) [3]	variable

Electives [2]

Course	Title	Hours
Select a minimum of two elective courses drawn from the list of recommended electives below.		variable

1

After year four, students may select a journal club offered by any department in the School of Medicine.

2

Students register for a combination of directed research and elective credit hours to amass a minimum of 60 total credit hours.

3

A minimum of 4 credits for all variable courses

Total graduate credit hours required (minimum) 60 credits

Recommended electives

Students select courses from this list, with guidance from their advisers and committees. Ph.D. students must enroll full-time (minimum nine credits) to be eligible for a stipend. Some graduate courses listed above may be taken after the comprehensive examination. Most of this course work should be taken during the first two years of the program. Students are encouraged to take additional courses that relate to their personal research projects.

Course	Title	Hours
ANAT 615	Techniques in Neuroscience and Cell Biology	3
BIOC 601	Membranes and Lipids	3
BIOC 602	Physical Properties of Macromolecules	1-4
BIOC 604	Enzymology	1-3
BIOC 605	Molecular Biology	2
HGEN 501/BIOL 530	Introduction to Human Genetics	3
MICR 505	Immunobiology	3
MICR 605	Prokaryotic Molecular Genetics	3
MICR 607	Techniques in Molecular Biology and Genetics	2
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	3
PHTX 691	Special Topics in Pharmacology	1-4

Typical plan of study

Many students often take more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a

student or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors and advisers for information about typical plans of study and registration requirements.

Graduate program director
Tomasz K. Kordula, Ph.D.
Professor, Department of Biochemistry and Molecular Biology
tkordula@vcu.edu
(804) 828-0771

Program website: biochemistry.vcu.edu (http://www.biochemistry.vcu.edu)

Biochemistry, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The doctoral curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
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   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
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Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. A personal statement that includes: long-term career goals to assess reasons behind the application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)
7. Laboratory experience – strongly recommended

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 41 graduate credit hours.

During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Prior to the beginning of the third year of study, students should successfully pass written and oral candidacy examinations. Following completion of the research project and defense of the doctoral dissertation, graduates are equipped to participate in a broad range of current biomedical research areas.

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology [1]	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 602	Physical Properties of Macromolecules (module one and two)	2
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
IBMS 620	Laboratory/Clinical Rotations (three rotations)	6
Select one of the following (or an equivalent):		1
IBMS 630	Critical Thinking	
BIOC 691	Special Topics in Biochemistry	
HGEN 691	Special Topics in Genetics	
IBMS 680	Proposal Preparation	1
IBMS 690	Basic Health Sciences Research Seminar (first year only)	1
MICR 605	Prokaryotic Molecular Genetics	3
MICR 607	Techniques in Molecular Biology and Genetics	2
Take one credit in the following every semester beginning in the second year:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG)	
Take the following course at least twice:		variable
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club)	
Select one of the following:		1
OVPR 601	Scientific Integrity	

OVPR 602	Responsible Scientific Conduct
OVPR 603	Responsible Conduct of Research

1

Students may complete the five-credit module sequence BIOC 530, BIOC 531, BIOC 532 and BIOC 533 in place of BIOC 503.

Eukaryotic molecular biology course

Course	Title	Hours
Select one of the following (or an approved alternative):		3
BIOC 605	Molecular Biology	
HGEN 602	Genetic Models of Disease	
HGEN 614	Pathogenesis of Human Genetic Disease	
IBMS 635	Cellular Signalling	
MICR 684	Molecular Biology of Cancer	
PATH 670	Experimental Approaches to Tumor Biology	

Directed research and electives

Course	Title	Hours
Select a variable number of credit hours of the following to amass the required minimum of 41 credit hours.		variable
BIOC 697	Directed Research in Biochemistry	
Electives		

Total graduate credit hours required (minimum) 41

Typical plan of study

Many students often take more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a student or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors and advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
Professor, Department of Microbiology and Immunology
christie@vcu.edu
(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Biochemistry, Master of Science (M.S.)

Program goal

The M.S. program in biochemistry prepares students for research-oriented careers in academia, government and biotechnology. The core of this degree program is an original independent research project under the supervision of a faculty adviser. The Department of Biochemistry and Molecular Biology has research efforts of international stature in several areas, including cellular and molecular signaling, tumor biology, structural biology, eukaryotic molecular biology, lipid and membrane biochemistry and molecular genetics, using state-of-the-art approaches in enzymology, genomics, proteomics and lipidomics.

While emphasizing independent research in biochemistry and molecular biology and training in the responsible conduct of research, the program also provides a background of courses designed to match the needs and interests of each student. The program is designed to provide students with the skills required to advance to positions as bioscience researchers/trainers in a broad spectrum of positions. The program provides a framework for the progressive development of a mastery of the current state of the subject matter of biochemistry, cell and molecular biology, as well as an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience.

The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments.
2. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids.
3. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations.
4. General knowledge of science: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications.
5. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin

and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall preferred	Applications accepted through June; priority given to early applicants	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs.

Applicants to the Master of Science in Biochemistry program must meet all general admission requirements of the VCU Graduate School (p. 34). In addition, applicants must meet the following requirements.

1. Organic chemistry (with a minimum grade of B)
2. Undergraduate biochemistry (not required but recommended)
3. Laboratory experience
4. GRE scores of at least 158 (verbal), 158 (quantitative) and 4.0 analytical

Continuing for the Ph.D.

Students who plan to eventually work toward the Ph.D. degree in biochemistry at VCU should apply directly to our Ph.D. program and forego the master's degree. Applicants who are unsure if they want to earn a Ph.D. and who wish to gain experience in biomedical research before making this decision will be well served by our M.S. program. Outstanding performance in our master's program can help students gain admittance to a doctoral program at VCU or elsewhere. Master's students wishing to gain admission to the Ph.D. program should submit the following documents to the graduate program director: (1) a letter making this request which should include justification for the request, career goals, name of proposed Ph.D. adviser and brief description of proposed Ph.D. research project, (2) VCU graduate transcript and (3) a letter of support from proposed Ph.D. adviser. Additional admissions requirements include (1) a grade of A in BIOC 691, (2) a grade of A in BIOC 505 (laboratory rotation), (3) a final score in the top 50 percent of scores in BIOC 503-BIOC 504 and (4) GRE scores of at least 158 (verbal), 158 (quantitative) and 4.0 analytical.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the M.S. in Biochemistry program must complete a minimum of 30 credit hours, including at least 24 didactic credits hours (exclusive of research credit hours).

Students in the M.S. program in biochemistry take courses designed for graduate students with an emphasis on research design and experimentation. During the first year of study, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin thesis research. Following completion of the research project and defense of the master's thesis, graduates are equipped to participate in virtually any area of current biomedical research in the most prestigious laboratories. For more detailed information on the program, visit biochemistry.vcu.edu/education/masters/default.htm (http://www.biochemistry.vcu.edu/education/masters/default.htm).

M.S. students register for BIOC 690 and BIOC 691 for the duration of their tenure in the program. The core set of courses may be supplemented with elective courses offered by the Department of Biochemistry and Molecular Biology or other departments. Students are encouraged to take additional courses that relate to their personal projects. Electives may include courses in techniques in molecular biology and genetics, bioinformatics, statistics, immunology, microbiology, molecular genetics, mammalian physiology and advanced organic and physical chemistry, among others.

Training in the responsible conduct of research

All M.S. students are required to complete the following training in the responsible conduct of research:

1. OVPR 601, OVPR 602 or OVPR 603
2. Collaborative Investigator Training Initiative: an online course that provides training in human subjects research. The course must be completed during the fall semester of year two. Students must submit the certificate of completion before starting the spring semester of year two. Consult the following link to access the course: research.vcu.edu/human_research/citi_requirements.htm (http://www.research.vcu.edu/human_research/citi_requirements.htm)
3. Animal research training: Students are required to complete an online training course for the conduct of animal subjects research. The training must be completed during the fall semester of year two. Students must submit the certificate of completion before starting the spring semester of year two. Access and guidance for the course is available through the "Animal Research" link on the **Office of Research and Innovation website**.

Curriculum requirements

Required course work

Students must take a minimum of 24 didactic credit hours from the following list of courses.

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 505	Experimental Biochemistry (research rotation, typically taken in year one)	2
or BIOC 697	Directed Research in Biochemistry	
BIOC 602 & BIOC 604	Physical Properties of Macromolecules and Enzymology [1]	4
Take the following courses each fall and spring throughout the program		variable
BIOC 651	Biochemistry Journal Club (year two until program complete)	1
BIOC 690	Biochemistry Seminar	variable
Take one or both of the following (typically during year one) for a total of two credits.		2
IBMS 630	Critical Thinking	
or BIOC 661	Critical Thinking	
IBMS 600	Laboratory Safety	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	

1

Students will select modules from BIOC 602, typically year one, and BIOC 604, typically year two, to complete a total of four credit hours, at least one credit hour from each course.

2

One- to four-credit course in which students must register for the duration of their tenure in the program for a minimum of four credit hours.

Directed research

Course	Title	Hours
Directed research (minimum 6 credits):		variable
BIOC 697	Directed Research in Biochemistry (to be taken each fall and spring semester)	

Electives

(suggested but not required)

Course	Title	Hours
Select two credits from the following:		(2)
ANAT 615	Techniques in Neuroscience and Cell Biology	
BIOC 601	Membranes and Lipids	
HGEN 501/ BIOL 530	Introduction to Human Genetics	
MICR 505	Immunobiology	
MICR 605	Prokaryotic Molecular Genetics	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
PHTX 691	Special Topics in Pharmacology	

Total graduate credit hours required (minimum) 30

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director

Tomasz K. Kordula, Ph.D.
Professor, Department of Biochemistry and Molecular Biology
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(804) 828-0771

Program website: biochemistry.vcu.edu (http://www.biochemistry.vcu.edu)

Biochemistry, Master of Science (M.S.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The master's curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology or provide the foundation for further graduate study toward a Ph.D.

It is expected that the program should be completed in approximately two to two-and-one-half years.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

A master's student in the MBG curriculum must prepare a formal written research plan and make an oral presentation of their thesis research proposal and progress report to their graduate advisory committee prior to the beginning of the second year of residency. The student's knowledge in the area of the proposed research, current research accomplishments and the feasibility of the proposed research project will be evaluated by the GAC. Successful completion of this review is required for continuance in the program and constitutes admission to candidacy.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Deadline date rolling, preference given to applications received by Jan 17	GRE. TOEFL for applicants whose native language is not English

Special requirements

- Applications for the program should be submitted to Molecular Biology and Genetics – M.S. selected from the drop-down menu of programs of the VCU online graduate application form. The degree awarded will be a Master of Science in Biochemistry.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned or expect to earn a baccalaureate or equivalent degree, and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics. Laboratory experience is also strongly recommended. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals. International applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the interdisciplinary master's curriculum in molecular biology and genetics requires a minimum of 48 credit hours, at least half of which must be course work restricted to graduate students. The curriculum includes 19 credit hours of required core course work and 29 additional credit hours of required course work, directed research and research seminar course work, and additional approved course work, as listed below. M.S. candidates must pass a final oral examination. A written thesis approved by the student's graduate advisory committee completes the requirements leading to the M.S. degree.

Curriculum requirements

Required core courses

Course	Title	Hours
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function [1]	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism [1]	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology [1]	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics [1]	1
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (sections 004 and 005; two credits taken twice) [2]	4
MICR 607	Techniques in Molecular Biology and Genetics	2
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club, must take at least once)	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		19

Other required course work (29 credits)

Course	Title	Hours
Select a minimum of one credit hour of directed research every semester of enrollment in the program after the first year of study from:		variable
BIOC 697	Directed Research in Biochemistry	
or MICR 697	Directed Research in Microbiology	
Select a minimum of one credit hour of research seminar course work every fall and spring semester of enrollment in the program from:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG; one credit course)	

Select any appropriate graduate-level course offered by the School of Medicine or with the course designations of BIOL, BNFO, CHEB, CHEM, CLSE, EGRB, EPID, MEDC	3

Students may take additional course work with the approval of their graduate program directors.

Total graduate credit hours required (minimum) 48

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
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(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Biostatistics, Doctor of Philosophy (Ph.D.)

Program goal

The mission of the VCU Department of Biostatistics is to improve human health through methodological research, the education of graduate students and health science researchers in biostatistical methods and applications, and collaborative health sciences research. Faculty members conduct methodological research motivated by collaborative alliances, which in turn contributes to and enhances the department's educational mission. By focusing on the integration of methodological and collaborative research, students develop strong biostatistical and communication skills, enabling them to assume leadership positions in academia, government and industry.

Student learning outcomes

This training program is designed to help students achieve the following learning outcomes:

1. The successful candidate will understand the modern and advanced literature of biostatistical concepts, ideas and methods, to which the candidate will contribute by developing new (or extending existing) biostatistical methods through scholarly peer-reviewed publications.
2. The successful candidate will demonstrate the ability to effectively collaborate with both biostatistical and health science researchers, specifically with respect to planning and designing research studies and also in analyzing data from a broad spectrum of research questions.
3. The successful candidate will develop fluency in several computational languages, will exhibit proficiency in standard computational and analytic procedures and will demonstrate the ability to computationally solve new and complex problems.
4. The successful candidate will display exceptional written and oral communication skills in terms of explaining biostatistical concepts, methods and results to both biostatistical and non-biostatistical health sciences researchers.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must complete the verbal, quantitative and analytical writing sections of the Graduate Record Exam. The following mathematics courses or their equivalents are required for admission: MATH 307, MATH 310, STAT 309 and STAT 212. MATH 507 and an additional graduate-level math analysis course are recommended for students interested in completing the Ph.D. program.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), Ph.D. students must complete a minimum total of 78 credit hours (59 didactic hours, plus eight hours each of seminar and consulting, and at least three credit hours of research). More specifically, required courses include BIOS 513, BIOS 514, BIOS 524, BIOS 553, BIOS 554, BIOS 571, BIOS 572, BIOS 573, BIOS 615, BIOS 631, BIOS 647 and one of OVPR 601, OVPR 602 or OVPR 603. Students must take at least 18 credits of additional BIOS, STAT or MATH courses, with at least two being BIOS courses and at least two being at the 600 level, and one graduate-level non-BIOS, STAT or MATH course. Ph.D. students must also take eight semesters each of BIOS 516 and BIOS 690. In addition, Ph.D. students will participate in the summer student training program at least twice and present at the Biostatistics Student Research Symposium each fall.

Qualifying exam

Students pursuing the Ph.D. degree must pass a two-part qualifying examination administered after completion of their first-year courses. Part A (the theoretical examination) covers material from the following first-year courses: BIOS 513, BIOS 514, BIOS 553 and BIOS 554. Part B (the applied examination) covers material from the following first-year courses: BIOS 524, BIOS 571, BIOS 572 and BIOS 573.

Each part of the exam is graded as pass or fail. A student must pass both Part A and Part B of the qualifying exam at the Ph.D. level to continue in the Ph.D. program. A student who does not pass either Part A or Part B of the qualifying examination at the Ph.D. level will have one opportunity to retake that part of the qualifying examination.

Dissertation proposal defense

Students pursuing the Ph.D. degree who have passed the qualifying exam must pass a defense of their dissertation proposal that will consist of both written and oral components. For the written component of the dissertation proposal defense the student will produce a detailed report and description of the proposed research plan. For the oral component of the dissertation proposal defense the student will present the dissertation proposal to their dissertation committee and respond to any feedback or questions.

The proposal defense will be scheduled as soon as the student is ready after passing both parts of the qualifying examination. This could be as early as Year 2, with students required to defend before December of their fourth year.

Each part of the exam is graded as pass or fail. A student must pass both Part A and Part B of the dissertation proposal defense to continue toward their final dissertation defense. A student who does not pass both Part A and Part B of the dissertation proposal defense may choose to complete the requirements for an M.S. degree.

Admission to candidacy

A student must pass both parts A and B of their qualifying examination, must identify a dissertation adviser and committee and must pass both the written and oral components of the dissertation proposal defense before they can be admitted to candidacy.

Dissertation

A comprehensive dissertation reporting the results of original research is required for the Ph.D. degree.

Final examination

All Ph.D. candidates must defend their dissertations at a final oral examination. A public presentation will precede a Ph.D. defense closed to all but the student's committee. Questions are restricted to the topic of the dissertation for the Ph.D. candidate.

Curriculum requirements

Required core courses

Course	Title	Hours
BIOS/STAT 513	Mathematical Statistics I	3
BIOS/STAT 514	Mathematical Statistics II	3
BIOS 524	Biostatistical Computing	3
BIOS 553	Biostatistical Methods I	4
BIOS 554	Biostatistical Methods II	4
BIOS 571	Clinical Trials	3
BIOS 572	Analysis of Biomedical Data I	3
BIOS 573	Analysis of Biomedical Data II	3
BIOS 615	Advanced Inference	4
BIOS 631	Mixed Models and Longitudinal Data Analysis	4
BIOS 647	Survival Analysis	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		38

At least 18 credits must come from the courses listed below (at least two must be BIOS courses; at least two must be at the 600-level) or others selected with approval of program director

Course	Title	Hours
Select 18 credits from the following, adhering to requirements noted above.		18
BIOS 549	Spatial Data Analysis	
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BIOS 632	Multivariate Analysis	
BIOS 635	Structural Equation Modeling	

BIOS 638	Statistical Design and Analysis in Toxicology
BIOS 639	Statistical Design and Analysis in Toxicology
BIOS 649	Advanced Spatial Data Analysis
BIOS 667	Statistical Learning and Data Mining
BIOS 671	Nonlinear Models
BIOS 668	Statistical Methods for High-throughput Genomic Data II
BIOS 688	Applied Bayesian Biostatistics
BIOS 691	Special Topics in Biostatistics
MATH 640	Mathematical Biology I
STAT 613	Stochastic Processes
STAT 614	Stochastic Processes
STAT/OPER 636	Machine Learning Algorithms
STAT 642	Design and Analysis of Experiments I
STAT 645	Bayesian Decision Theory
STAT 675	Time Series Analysis I
Total Hours	18

Additional course

Course	Title	Hours
Select one additional course (non-BIOS, non-STAT or non-MATH) with approval or program director. Suggested courses include:		3
Any three-credit 600-level course in epidemiology and community health (EPID)		
Social and behavioral health (SBHD)		
Health care policy and research (HCPR)		
Bioinformatics (BNFO)		
Total Hours		3

Consulting and seminar courses

Course	Title	Hours
BIOS 516	Biostatistical Consulting (one-credit course taken for eight semesters)	8
BIOS 690	Biostatistical Research Seminar (one-credit course taken for eight semesters)	8
Total Hours		16

Dissertation research

Course	Title	Hours
BIOS 697	Directed Research in Biostatistics (variable credit; taken for a minimum of three credits)	3
Total Hours		3

Total graduate credit hours required (minimum) 78

Graduate program director
Roy T. Sabo, Ph.D.
Associate professor, Department of Biostatistics
roy.sabo@vcuhealth.org
(804) 828-3047

Additional contact (admissions and prospective students)
Russell M. Boyle
Assistant professor, Department of Biostatistics, and associate program director
russell.boyle@vcuhealth.org
(804) 827-2049

Program website: biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

Biostatistics, Doctor of Philosophy (Ph.D.) with a concentration in genomic biostatistics

Program goal

The mission of the VCU Department of Biostatistics is to improve human health through methodological research, the education of graduate students and health science researchers in biostatistical methods and applications, and collaborative health sciences research. Faculty members conduct methodological research motivated by collaborative alliances, which in turn contributes to and enhances the department's educational mission. By focusing on the integration of methodological and collaborative research, students develop strong biostatistical and communication skills, enabling them to assume leadership positions in academia, government and industry.

Student learning outcomes

This training program is designed to help students achieve the following learning outcomes:

1. The successful candidate will understand the modern and advanced literature of biostatistical and genomics concepts, ideas and methods, to which the candidate will contribute by developing new (or extending existing) biostatistical and genomics methods through scholarly peer-reviewed publications.
2. The successful candidate will demonstrate the ability to effectively collaborate with biostatistical, genomics and health science researchers, specifically with respect to planning and designing research studies, and also in analyzing data from a broad spectrum of research questions.
3. The successful candidate will develop fluency in several computational languages, will exhibit proficiency in standard computational and analytic procedures and will demonstrate the ability to computationally solve new and complex problems.
4. The successful candidate will display exceptional written and oral communication skills in terms of explaining biostatistical and genomics concepts, methods and results to both biostatistical and non-biostatistical health sciences researchers.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must complete the verbal, quantitative and analytical writing sections of the Graduate Record Exam. The following mathematics courses or their equivalents are required for admission: MATH 307, MATH 310, STAT 309 and STAT 212. MATH 507 and an additional graduate-level math analysis course are recommended for students interested in completing the Ph.D. program.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), Ph.D. students in the genomic biostatistics concentration will complete a minimum of 78 graduate credit hours (59 didactic credit hours plus eight hours each of consulting and seminar, and at least three credit hours of research). More specifically, required courses include: BIOS 513, BIOS 514, BIOS 524, BIOS 553, BIOS 554, BIOS 567, BIOS 571, BIOS 572, BIOS 573, BIOS 615, BIOS 632, BIOS 647, BIOS 668, BNFO 540 (or BIOL 540) and one of OVPR 601, OVPR 602 or OVPR 603. In addition, students will take one of BIOS 667 or BIOS 691, and at least nine credits of other graduate-level BIOS, STAT, MATH or BNFO courses. Ph.D. students must take eight semesters each of BIOS 516 and BIOS 690. Ph.D. students will also participate in the summer student research program at least twice and present at the Biostatistics Student Research Symposium each fall.

Qualifying exam

Students pursuing the Ph.D. degree must pass a two-part qualifying examination administered after completion of their first-year courses. Part A (the theoretical examination) covers material from the following first-year courses: BIOS 513, BIOS 514, BIOS 553 and BIOS 554. Part B (the applied examination) covers material from the following first-year courses: BIOS 524, BIOS 571, BIOS 572 and BIOS 573.

Each part of the exam is graded as pass or fail. A student must pass both Part A and Part B of the qualifying exam at the Ph.D. level to continue in the Ph.D. program. A student who does not pass either Part A or Part B of the qualifying examination at the Ph.D. level will have one opportunity to retake that part of the qualifying examination.

Dissertation proposal defense

Students pursuing the Ph.D. degree who have passed the qualifying exam must pass a defense of their dissertation proposal that will consist of both written and oral components. For the written component of the dissertation proposal defense the student will produce a detailed report and description of the proposed research plan. For the oral component of the dissertation proposal defense the student will present the dissertation proposal to their dissertation committee and respond to any feedback or questions.

The proposal defense will be scheduled as soon as the student is ready after passing both parts of the qualifying examination. This could be as early as Year 2, with students required to defend before December of their fourth year.

Each part of the exam is graded as pass or fail. A student must pass both Part A and Part B of the dissertation proposal defense to continue toward their final dissertation defense. A student who does not pass both Part A and Part B of the dissertation proposal defense may choose to complete the requirements for an M.S. degree.

Admission to candidacy

A student must pass both parts A and B of their qualifying examination, must identify a dissertation adviser and committee and must pass both the written and oral components of the dissertation proposal defense before they can be admitted to candidacy.

Dissertation

A comprehensive dissertation reporting the results of original research related to genomics topics is required for the Ph.D. with a concentration in genomic biostatistics. It is expected that the dissertation will make use of some high-throughput genomic technology as an application for the methodological development.

Final examination

All Ph.D. candidates must defend their dissertations at a final oral examination. A public presentation will precede a Ph.D. defense closed to all but the student's committee. Questions are restricted to the topic of the dissertation for the Ph.D. candidate.

Curriculum requirements

Required core courses

Course	Title	Hours
BIOL/BNFO 540	Fundamentals of Molecular Genetics (or other relevant course)	3
BIOS/STAT 513	Mathematical Statistics I	3
BIOS/STAT 514	Mathematical Statistics II	3
BIOS 524	Biostatistical Computing	3
BIOS 553	Biostatistical Methods I	4
BIOS 554	Biostatistical Methods II	4
BIOS 567	Statistical Methods for High-throughput Genomics Data I	3
BIOS 571	Clinical Trials	3
BIOS 572	Analysis of Biomedical Data I	3
BIOS 573	Analysis of Biomedical Data II	3
BIOS 615	Advanced Inference	4
BIOS 632	Multivariate Analysis	3
BIOS 647	Survival Analysis	3
BIOS 668	Statistical Methods for High-throughput Genomic Data II	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		46

BIOS/STAT courses

Course	Title	Hours
BIOS 667	Statistical Learning and Data Mining	3
or BIOS 691	Special Topics in Biostatistics	
(Note: Another course may be chosen with approval of program director.)		
Total Hours		3

Additional course

Course	Title	Hours
At least nine credits must come from the BIOS, STAT, MATH or BNFO courses listed below (or another with approval of program director):		9
BIOS 549	Spatial Data Analysis	
BIOS 631	Mixed Models and Longitudinal Data Analysis	
BIOS 635	Structural Equation Modeling	
BIOS 638	Statistical Design and Analysis in Toxicology	
BIOS 639	Statistical Design and Analysis in Toxicology	
BIOS 649	Advanced Spatial Data Analysis	
BIOS 688	Applied Bayesian Biostatistics	
BIOS 691	Special Topics in Biostatistics	
BNFO/BIOL 601	Integrated Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	
MATH 640	Mathematical Biology I	
STAT 613	Stochastic Processes	
STAT 614	Stochastic Processes	
STAT/OPER 636	Machine Learning Algorithms	
STAT 642	Design and Analysis of Experiments I	
STAT 645	Bayesian Decision Theory	
STAT 675	Time Series Analysis I	
Total Hours		9

Consulting and seminar courses

Course	Title	Hours
BIOS 516	Biostatistical Consulting (one-credit course taken for eight semesters)	8
BIOS 690	Biostatistical Research Seminar (one-credit course taken for eight semesters)	8
Total Hours		16

Dissertation research

Course	Title	Hours
BIOS 697	Directed Research in Biostatistics (variable credit; taken for a minimum of four credits)	4
Total Hours		4

Total graduate credit hours required (minimum) 78

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contact (admissions and prospective students)
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russell.boyle@vcuhealth.org
(804) 827-2049

Program website: biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

Biostatistics, Master of Science (M.S.)

Program goal

The mission of the VCU Department of Biostatistics is to improve human health through methodological research, the education of graduate students and health science researchers in biostatistical methods and applications, and collaborative health sciences research. Faculty members conduct methodological research motivated by collaborative alliances, which in turn contributes to and enhances the department's educational mission. By focusing on the integration of methodological and collaborative research, students develop strong biostatistical and communication skills, enabling them to assume leadership positions in academia, government and industry.

Student learning outcomes

This training program is designed to be completed in 18 months (four semesters: fall, spring, summer, fall) and will help students achieve the following learning outcomes:

1. The successful candidate will understand the modern and advanced literature of biostatistical concepts, ideas and methodologies.
2. The successful candidate will demonstrate the ability to effectively collaborate with both biostatistical and health science researchers, specifically with respect to planning and designing research studies, and also in analyzing data from a broad spectrum of research questions.
3. The successful candidate will develop fluency in several computational languages, will exhibit proficiency in standard computation and analytic procedures, and will demonstrate the ability to computationally solve new and complex problems.
4. The successful candidate will display exceptional written and oral communication skills in terms of explaining biostatistical concepts, methods and results to both biostatistical and non-biostatistical health sciences researchers.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants for the M.S. in Biostatistics must complete the verbal, quantitative and analytical writing sections of the Graduate Record Exam.

Additionally, the following mathematics courses or their equivalents are required for admission:

Course	Title	Hours
MATH 307	Multivariate Calculus	4
MATH 310	Linear Algebra	3

STAT 212	Concepts of Statistics	3
STAT 309	Introduction to Probability Theory	3

Although not required, prior course work in additional mathematics, statistics or computer science is helpful.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), M.S. students must complete a minimum total of 42 graduate credit hours of course work. Students are required to take BIOS 512 or BIOS 513, BIOS 524, BIOS 553, BIOS 554, BIOS 571, BIOS 572 and BIOS 573, and four other 500- or 600-level BIOS, STAT, MATH or BNFO courses. M.S. students must take four credit hours of BIOS 516 and three credit hours of BIOS 690. M.S. students interested in applying to the Ph.D. program in biostatistics (with no concentration or with a concentration in genomic biostatistics) are strongly encouraged to take both BIOS 513 and BIOS 514, participate in the Summer Student Training Program and present at the Biostatistics Student Research Symposium.

Qualifying exam

Students pursuing the M.S. degree must pass a qualifying examination administered after completion of their first-year courses. This applied examination covers material from the following first-year courses: BIOS 524, BIOS 571, BIOS 572 and BIOS 573. This examination is graded as pass or fail. A student must pass the qualifying examination at the M.S. level to continue in the M.S. program. A student who does not pass the qualifying examination at the M.S. level will have one opportunity to retake that part of the qualifying examination. Students interested in applying to the Ph.D. program in biostatistics (with no concentration or with a concentration in genomic biostatistics) are strongly encouraged to also take the theoretical component of the qualifying examination covering material from the following first-year courses: BIOS 513, BIOS 514, BIOS 553 and BIOS 554. These students must pass both the applied and theoretical qualifying examinations at the Ph.D. level in order to be considered in the Ph.D. program.

Thesis

There is no thesis requirement for the M.S. program.

Curriculum requirements

Core courses

Course	Title	Hours
BIOS 512	Basic Mathematical Statistics	3
or BIOS 513	Mathematical Statistics I	
BIOS 524	Biostatistical Computing	3
BIOS 553	Biostatistical Methods I	4
BIOS 554	Biostatistical Methods II	4
BIOS 571	Clinical Trials	3
BIOS 572	Analysis of Biomedical Data I	3
BIOS 573	Analysis of Biomedical Data II	3
Total Hours		23

Additional combination

Course	Title	Hours
Select at least four 500- or 600-level courses (minimum three credits), which may be selected from the following list or with program director approval:		12
BIOS 514	Mathematical Statistics II	
BIOS 549	Spatial Data Analysis	
BIOS 615	Advanced Inference	
BIOS 632	Multivariate Analysis	
BIOS 635	Structural Equation Modeling	
BIOS 638	Statistical Design and Analysis in Toxicology	
BIOS 639	Statistical Design and Analysis in Toxicology	
BIOS 647	Survival Analysis	
BIOS 649	Advanced Spatial Data Analysis	
BIOS 650	Design and Analysis of Response Surface Experiments	
BIOS 667	Statistical Learning and Data Mining	
BIOS 668	Statistical Methods for High-throughput Genomic Data II	
BIOS 688	Applied Bayesian Biostatistics	
STAT 613	Stochastic Processes	
STAT 614	Stochastic Processes	
STAT 625	Applied Multivariate Analysis	
Total Hours		12

Consulting and seminar

Course	Title	Hours
BIOS 516	Biostatistical Consulting (one-credit course taken four semesters)	4
BIOS 690	Biostatistical Research Seminar (one-credit course taken three semesters)	3
Total Hours		7

Total graduate credit hours required (minimum) 42

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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Associate professor, Department of Biostatistics
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Additional contact (admissions and prospective students)
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(804) 827-2049

Program website: biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

Biostatistics, Master of Science (M.S.) with a concentration in clinical research and biostatistics

Program goal

The mission of the VCU Department of Biostatistics is to improve human health through methodological research, the education of graduate students and health science researchers in biostatistical methods and applications, and collaborative health sciences research. Faculty members conduct methodological research motivated by collaborative alliances, which in turn contributes to and enhances the department's educational mission. By focusing on the integration of methodological and collaborative research, students develop strong biostatistical and communication skills, enabling them to assume leadership positions in academia, government and industry.

Student learning outcomes

1. Experimental design: Students will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
2. Integrated knowledge of statistics and bioscience: Students will demonstrate an appropriate level of knowledge of the current elements of statistics as related to bioscience and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.
3. Oral communication skills: Students will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
4. Problem-solving skills: Students will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Written communication skills: Students will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), students applying to the clinical research and biostatistics concentration must hold the M.D., D.D.S., Ph.D., D.P.H., D.O., Pharm.D. or an equivalent health professional terminal degree from an accredited college or university. Applicants with international M.D. degrees are considered on an individual basis. The applicant must have a minimum undergraduate GPA of 3.00. Applicants must also submit a letter detailing

career goals and how the M.S. in Biostatistics with a concentration in clinical research and biostatistics applies to those goals, as well as at least three letters of recommendation.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), M.S. in Biostatistics, clinical research and biostatistics concentration students must complete a minimum total of 34 graduate credit hours. This includes 17 credit hours of core course work, 12 credit hours of elective courses and at least five credit hours of directed independent research.

Students in the clinical research and biostatistics concentration must complete a research project, culminating in an academic manuscript submitted for publication. A research advisory committee must be formed to direct the student's research project. The research advisory committee must consist of two clinicians familiar with the student's area of research and a faculty member of the Department of Biostatistics. The student is be primarily responsible for the conceptualization, design, conduct, analysis and interpretation of the research project.

Final examination

Clinical research and biostatistics concentration students do not defend their research projects at a final oral examination.

Curriculum requirements

Core courses

Course	Title	Hours
BIOS 516	Biostatistical Consulting	1
BIOS 531	Clinical Epidemiology	3
or EPID 571	Principles of Epidemiology	
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	3
or STAT 544	Statistical Methods II	
BIOS 571	Clinical Trials	3
BIOS 572	Analysis of Biomedical Data I	3
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		17

Directed research

Course	Title	Hours
BIOS 697	Directed Research in Biostatistics (minimum five credits)	5

Electives

Course	Title	Hours
Select 12 credits from the suggested electives below		12

Total graduate credit hours required (minimum) 34

Suggested electives

Course	Title	Hours
Electives in biostatistics		
BIOS 524	Biostatistical Computing	3
BIOS 549	Spatial Data Analysis	3
BIOS 553	Biostatistical Methods I	4
BIOS 554	Biostatistical Methods II	4
BIOS 573	Analysis of Biomedical Data II	3
BIOS 610	Research Processes and Methods for the Health Professions	3
BIOS 691	Special Topics in Biostatistics	1-4
Electives in epidemiology and public health		
EPID 571	Principles of Epidemiology	3
EPID 600	Introduction to Public Health	3
EPID 601	Contemporary Issues and Controversies in Public Health	3
EPID 603	Public Health Policy and Politics	3
EPID 606	Epidemiologic Methods	3
EPID 607	Nutritional Epidemiology	3
EPID 620	Cancer Epidemiology	3
EPID 648	Behavioral Epidemiology	3
Electives in social and behavioral health		
SBHD 605	Introduction to Social and Behavioral Health	3
SBHD 610	Behavioral Measurement	3
SBHD 632	Health Disparities and Social Justice	3
SBHD 633	Structural Equation Modeling	3

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Roy T. Sabo, Ph.D.
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(804) 828-3047

Additional contact (admissions and prospective students)
Russell M. Boyle
Assistant professor, Department of Biostatistics, and associate program director
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(804) 827-2049

Program website: biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

Biostatistics, Master of Science (M.S.) with a concentration in genomic biostatistics

Program goal

The mission of the VCU Department of Biostatistics is to improve human health through methodological research, the education of graduate students and health science researchers in biostatistical methods

and applications, and collaborative health sciences research. Faculty members conduct methodological research motivated by collaborative alliances, which in turn contributes to and enhances the department's educational mission. By focusing on the integration of methodological and collaborative research, students develop strong biostatistical and communication skills, enabling them to assume leadership positions in academia, government and industry.

Student learning outcomes

This training program is designed to be completed in 18 months (four semesters: fall, spring, summer, fall) and will help students achieve the following learning outcomes:

1. The successful candidate will understand the modern and advanced literature of biostatistical and genomics concepts, ideas and methods.
2. The successful candidate will demonstrate the ability to effectively collaborate with both biostatistical, genomics and health science researchers, specifically with respect to planning and designing research studies, and also in analyzing data from a broad spectrum of research questions.
3. The successful candidate will develop fluency in several computational languages, will exhibit proficiency in standard computational and analytic procedures, and will demonstrate the ability to computationally solve new and complex problems.
4. The successful candidate will display exceptional written and oral communication skills in terms of explaining biostatistical and genomics concepts, methods and results to both biostatistical and non-biostatistical health sciences researchers.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall preferred	Applications received prior to Jan 15 given priority consideration	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants for the M.S. in Biostatistics must complete the verbal, quantitative and analytical writing sections of the Graduate Record Exam.

Additionally, the following mathematics courses or their equivalents are required for admission:

Course	Title	Hours
MATH 307	Multivariate Calculus	4
MATH 310	Linear Algebra	3
STAT 212	Concepts of Statistics	3
STAT 309	Introduction to Probability Theory	3

Although not required, prior course work in additional mathematics, statistics or computer science is helpful.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), M.S. students will complete a minimum total of 42 credit hours of course work. Required courses include BIOS 512 or BIOS 513, BIOS 524, BIOS 553, BIOS 554, BIOS 567, BIOS 571, BIOS 572, BIOS 573, BIOL 540

or BNFO 540, at least one of BIOS 632, BIOS 667,BIOS 668 and BIOS 691 (the latter when the topic is systems biology or statistical genetics/genetic epidemiology), and one other 500- or 600-level BIOS, STAT, MATH or BNFO course. M.S. students must take four credit hours of BIOS 516 and and three credit hours of BIOS 690. M.S. students interested in applying to the Ph.D. program in biostatistics (with no concentration or with a concentration in genomic biostatistics) are strongly encouraged to take both BIOS 513 and BIOS 514, participate in the Summer Student Training Program, and present at the Biostatistics Student Research Symposium.

Qualifying exam

Students pursuing the M.S. degree must pass a qualifying examination administered after completion of their first-year courses. This applied examination covers material from the following first-year courses: BIOS 524, BIOS 571, BIOS 572 and BIOS 573. This examination is graded as pass or fail. A student must pass the qualifying examination at the M.S. level to continue in the M.S. program. A student who does not pass the qualifying examination at the M.S. level will have one opportunity to retake the examination. Students interested in applying to the Ph.D. program in biostatistics (with no concentration or with a concentration in genomic biostatistics) are strongly encouraged to also take the theoretical component of the qualifying examination covering material from the following first-year courses: BIOS 513, BIOS 514, BIOS 553 and BIOS 554. These students must pass both the applied and theoretical qualifying examinations at the Ph.D. level in order to be considered in the Ph.D. program.

Thesis

There is no thesis requirement in the M.S. program.

Curriculum requirements

Core courses

Course	Title	Hours
BIOL/BNFO 540	Fundamentals of Molecular Genetics (or other relevant course)	3
BIOS 512	Basic Mathematical Statistics	3
or BIOS 513	Mathematical Statistics I	
BIOS 524	Biostatistical Computing	3
BIOS 553	Biostatistical Methods I	4
BIOS 554	Biostatistical Methods II	4
BIOS 567	Statistical Methods for High-throughput Genomics Data I	3
BIOS 571	Clinical Trials	3
BIOS 572	Analysis of Biomedical Data I	3
BIOS 573	Analysis of Biomedical Data II	3
Total Hours		29

Additional courses

Course	Title	Hours
Select one of the following:		3
BIOS 632	Multivariate Analysis	
BIOS 667	Statistical Learning and Data Mining	
BIOS 668	Statistical Methods for High-throughput Genomic Data II	
BIOS 691	Special Topics in Biostatistics (systems biology or genetic epidemiology)	
Select at least one 500- or 600-level course (minimum three credits), which may be selected from the following list or with program director approval		3
BIOS 549	Spatial Data Analysis	
BIOS 615	Advanced Inference	
BIOS 631	Mixed Models and Longitudinal Data Analysis	
BIOS 635	Structural Equation Modeling	
BIOS 638	Statistical Design and Analysis in Toxicology	
BIOS 639	Statistical Design and Analysis in Toxicology	
BIOS 647	Survival Analysis	
BIOS 649	Advanced Spatial Data Analysis	
BIOS 650	Design and Analysis of Response Surface Experiments	
BIOS 688	Applied Bayesian Biostatistics	
STAT 613	Stochastic Processes	
STAT 614	Stochastic Processes	
STAT 625	Applied Multivariate Analysis	
Total Hours		6

Consulting and seminar

Course	Title	Hours
BIOS 516	Biostatistical Consulting (one-credit course taken four semesters)	4
BIOS 690	Biostatistical Research Seminar (one-credit course taken three semesters)	3
Total Hours		7

Total graduate credit hours required (minimum) 42

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Program website: biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

Epidemiology, Doctor of Philosophy (Ph.D.)

Program mission

The mission of the Ph.D. program in epidemiology is to educate and train students to become independent, competent and self-directed research scientists so they can conduct outstanding clinical and population-based research. Students will learn methods for studying disease etiology and prevention in populations and evaluating interventions, diagnostic tests and treatment efficacy; they will implement such methods in an independent research study under the mentorship of an experienced epidemiology researcher.

Program goals

1. Critical foundation skills: The program is designed to provide students with the critical skills required to advance to positions as epidemiological researchers/trainers in a broad spectrum of positions.
2. Mastery and application of science: The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of epidemiology and ability to synthesize this information and apply this foundation to the identification of key areas of investigation/experimentation in bioscience.
3. Communication: Students will develop skills in the various means of communicating both the core of epidemiological knowledge and the expression of epidemiological methodology, research design, results and interpretation to a variety of potential audiences.

Student learning outcomes

Students in the doctoral program in epidemiology will develop competencies in the following areas, as described below.

1. Integrated knowledge of epidemiology: Students will demonstrate an appropriate level of knowledge of theories of disease causation as well as bias in epidemiologic research and demonstrate in-depth understanding of one or more substantive theories related to research. Students will be able to appropriately link theoretical frameworks to the design, conduct and interpretation of epidemiologic research and demonstrate familiarity with the research literature and the ability to evaluate and critique publications appropriate to an independent research scientist.
2. Problem-solving skills: Students will be able to appropriately apply epidemiologic and statistical methods for research needs, demonstrating proficiency in selecting the appropriate measures of association for the research at hand and correctly implementing analytic techniques, including addressing issues such as confounding and effect modification. Students will be able to evaluate and interpret results, explaining relationships between determinant(s) and outcome(s) under study.
3. Research design: Students will construct and develop novel epidemiologic research questions, demonstrating proficiency in selecting the most appropriate study designs such that bias is minimized and efficiency maximized. Students will understand the required elements to estimate sample size, know how to identify and minimize bias and confounders through study design and analysis, and demonstrate knowledge of the impact of measurement issues on study validity.
4. Written communication skills: Students will demonstrate proficiency in scientific writing, including manuscript development, grant writing and writing for multiple audiences, including lay audiences and policy-makers. Students will demonstrate an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information, including the use of figures, tables and citations.
5. Oral communication skills: Students will demonstrate effective oral communication skills across disciplines, framing questions appropriately and implementing active listening skills in delivering oral presentations to professional audiences, lecturing to students or leading discussions. Students will appropriately use audio/visual technologies to develop effective presentations with respect to content, organization and appropriate use of language.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at sophas.org (http://www.sophas.org)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Application strongly encouraged by Jan 15	GRE, TOEFL

Special requirements

- Applicants must hold a master's degree, preferably in public health or a related field, and provide test scores as detailed below. Applicants must provide all required materials as described herein and in the VCU Admissions graduate application checklist.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum qualifications.

1. Prior degree: Master's degree in public health (M.P.H.) or equivalent M.S. degree, (e.g., sociology, biology, mathematics) with a minimum GPA of 3.0
2. GRE: Current GRE test results (taken within the past five years) with scores at or above the 75th percentile preferred in all components of the exam (e.g., minimum scores of 159 quantitative, 157 verbal and 4.5 analytical writing)
3. TOEFL: For non-native speakers of English, recommended minimum scores of either 100iBT, 600 PBT or IELTS scores of 6.5 (academic band score)
4. Personal statement: Applicants must include a personal statement that indicates their reasons for pursuing a doctoral degree in epidemiology, their particular areas of research focus or study, the departmental faculty advisers with whom the students would prefer to work, and career goals upon graduation.
5. Reference letters: Students must submit three letters of recommendation from three individuals who can assess the applicant's qualifications for graduate school. Letters from past professors or faculty advisers are most appropriate.
6. Current CV or resume: Students must submit a current CV or resume.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students will be required to complete a minimum of 61 graduate credit hours as follows:

1. Three core courses focusing on epidemiological methods (nine credit hours)
2. Two core courses focusing on biostatistical theory and methods (six credit hours)
3. Four semesters of journal club (four credit hours)
4. Four courses of methodological electives, including EPID 649 (12 credit hours)
5. Three courses of substantive area electives, with at least one relating to the biological processes associated with the student's chosen substantive area (nine credit hours)
6. A minimum of two credit hours of practical research skills development
7. At least one course in the responsible conduct of research (one credit hour)
8. At least 18 credit hours of directed dissertation research

Students will also be required to complete the following:

Practical experience

1. Teaching experience: All doctoral students are required to serve as a teaching assistant for at least one semester before graduation. The student and her/his adviser discuss which course would be best-suited for the teaching assistantship.
2. Seminar attendance: All students are expected to attend all doctoral level Division of Epidemiology seminars during their tenure in the program. These seminars are generally held every other week during fall and spring semesters. In addition, students must attend any special public health seminars offered collaboratively by the public health departments. These special seminars may occur one to two times each semester.
3. Grant application submission: All students are required to submit at least one grant application related to their dissertation to a federal or nongovernmental funder to gain grantsmanship experience.

Comprehensive exams

Comprehensive exams include a written examination that assesses knowledge of completed didactic course work on core epidemiologic and biostatistical methods as well as a tailored substantive section based on the student's research focus and an oral comprehensive exam based upon the student's dissertation proposal.

Dissertation

1. The dissertation must be a hypothesis-based, analytical epidemiology project designed by the student under the supervision of the faculty adviser and advisory committee members as appropriate.
2. Students develop and submit three manuscripts from the dissertation to peer-reviewed journals. Students should have submitted at least one manuscript before their final defense.

Curriculum requirements

Core courses

Course	Title	Hours
Core courses		
EPID 650	Epidemiologic Methods for Research	3
EPID 651	Intermediate Epidemiologic Methods for Research	3
EPID 652	Advanced Epidemiologic Methods and Data Analysis	3

EPID 690	Journal Club (taken four semesters)	4
STAT 643	Applied Linear Regression	3
STAT 744	Regression II	3
Methodological electives		
EPID 649	Analysis of Health Datasets	3
Select nine credits from the following:		9
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BIOS 631	Mixed Models and Longitudinal Data Analysis	
BIOS 632	Multivariate Analysis	
BIOS 647	Survival Analysis	
BIOS 668	Statistical Methods for High-throughput Genomic Data II	
BIOS 671	Nonlinear Models	
BIOS 691	Special Topics in Biostatistics	
BNFO 601	Integrated Bioinformatics	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
CCTR 692	Special Topics in Translational Research	
EPID 620	Cancer Epidemiology	
EPID 622	Maternal and Child Health	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 648	Behavioral Epidemiology	
EPID 691	Special Topics	
EPID 692	Independent Study	
HADM 763	Applied Health Services Research	
HCPR 730	Survey Research Methods and Analysis for Health Policy	
HGEN 603	Mathematical and Statistical Genetics	
HGEN 617	Genetic Analysis of Complex Traits	
HGEN 619	Quantitative Genetics	
PHAR 688	Applied Pharmacoepidemiology Research Methods	
PPAD 723	Survey Research Methods	
PSYC 655	Community Interventions: Development, Implementation and Evaluation	
SBHD 610	Behavioral Measurement	
SBHD 631	Disseminating, Adopting and Adapting Evidence-based Prevention Programs	
SBHD 633	Structural Equation Modeling	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	
SBHD 638	Applications in Qualitative Research Methods	
SOCY 656	Social Network Analysis	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 625	Spatial Database Management and GIS Modeling	
URSP 627	GIS Applications in Urban Design	
Substantive area electives		
Select three courses of substantive area electives, at least one relating to the biological processes associated with the student's chosen substantive area from the following:		9
EPID 603	Public Health Policy and Politics	
EPID 620	Cancer Epidemiology	
EPID 622	Maternal and Child Health	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 648	Behavioral Epidemiology	
EPID 691	Special Topics	
EPID 692	Independent Study	
GRTY 601	Biological and Physiological Aging	
GRTY/PSYC 602	Psychology of Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
GRTY 606	Aging and Human Values	
GSWS 620	Theorizing Sexuality	
HADM 602	Health System Organization, Financing and Performance	
HADM 611	Health Care Law and Bioethics	
HADM 615	Health Care Politics and Policy	
HADM 624	Health Economics	
HCPR 610	Foundations in Health Services Research Methods	
HCPR 701	Health Services Research and Policy I	
HCPR 702	Health Services Research and Policy II	
HADM 704	Foundations of Health Service Organization Theory	
HADM 705	Advanced Health Service Organization Theory	
HCPR 720	Economics of Health Disparities	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 610	Current Literature in Human Molecular Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
NURS 502	Advanced Nursing Practice: Pharmacotherapeutics	
PSYC 629	Biological Basis of Behavior	
PSYC 630	Social Psychology	
PSYC 660	Health Psychology	
PSYC 679	Culture, Ethnicity and Health	
SBHD 611	Health Literacy	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	

SBHD 631	Disseminating, Adopting and Adapting Evidence-based Prevention Programs	
SBHD 632	Health Disparities and Social Justice	
SBHD 634	Patient-Provider Interaction	
SBHD 637	Program Evaluation	
SLWK 746	Social Work Practice and Psychopharmacology	
SLWK 761	Interpersonal Violence	
Practical research skills development		
Select a minimum of two credits from the following:		2
ALHP 716	Grant Writing and Project Management in Health Related Sciences	
BIOS 610	Research Processes and Methods for the Health Professions	
EPID 691	Special Topics	
GRAD 601	The Academic Profession	
GRTY 608	Grant Writing	
Responsible research conduct		
Select at least one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Dissertation		
Take a minimum of 18 credits in the following:		18
EPID 697	Directed Research in Epidemiology	

Total graduate credit hours required (minimum) 61

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. A typical plan of study is available on the department's website (https://familymedicine.vcu.edu/epidemiology/phd).

Graduate program director
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Program website: familymedicine.vcu.edu/epidemiology/phd (http://www.familymedicine.vcu.edu/epidemiology/phd)

Genetic Counseling, Master of Science (M.S.)

Program accreditation
Accreditation Council for Genetic Counseling

Program goals

1. Competency in genetic counseling
2. Eligibility for certification by the American Board of Genetic Counseling
3. Preparation for careers in genetic counseling and human genetics and genomics

Successful candidates will demonstrate competency in all four genetic counseling domains: I – genetic expertise and analysis, II – interpersonal, psychosocial, and counseling skills, III – education and IV – professional development and practice.

Student learning outcomes

1. Competency in practice: The candidate should demonstrate development of competency in the responsible practice of genetic counseling. This will be assessed in the clinical setting by certified genetic counselors and medical geneticists. The assessment is based upon the core clinical competencies established by the Accreditation Council for Genetic Counseling. These competencies are documented with written and oral evaluations at the completion of each of the clinical rotations by the rotation supervisor.
2. General knowledge of sciences: The candidate should demonstrate a general knowledge of the elements of the sciences as related to genetic molecular/cellular bioscience and a detailed knowledge of his or her area of research, including an appropriate familiarity with the research literature. The student is evaluated by academic performance, face-to-face and written evaluation of clinical performance in multiple rotations by multiple supervisors and annual written and oral exams.
3. Communication skills: The candidate should demonstrate that an appropriate level of oral, written and visual communication skills have been acquired. This is achieved by evaluations of clinical rotations both written and verbal that are based on the competencies established by the Accreditation Council for Genetic Counseling and the scope of practice as set forth by the National Society of Genetic Counselors.

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Applications received prior to Jan 15 given priority consideration	GRE within five years of application; international applicants must score 100 or greater on the TOEFL.

In addition to the general admission requirements of the VCU Graduate School (p. 34):

1. Applicants must have successfully completed undergraduate training and hold a baccalaureate degree from an accredited university or college.
2. Applicants must write a personal essay, no longer than two pages, indicating their interest and suitability to the field of genetic counseling.
3. Prerequisites for admission include six credit hours each of biology, chemistry and behavioral science (psychology, anthropology, sociology, religion or philosophy) and three credit hours each of biochemistry, statistics and genetics. It is recommended that all prerequisite courses have been completed within 10 years of application. A prerequisite may be in process at the time of application. A minimum grade of a B must be obtained prior to admission if the course is in progress at the time of acceptance.
4. Students accepted to the program are generally drawn from applicants with a minimum undergraduate grade-point average of 3.0 (on a 4.0 scale or equivalent), with an average GPA of 3.3 to 3.5 for matriculating students.
5. The Graduate Record Examination is required for admission; there is no MCAT substitution. The GRE should be taken within five years of application submission. Matriculating students generally have GRE verbal scores at or above 153, quantitative scores at or above 144 and a writing performance above a score of 3.5 on the analytical section.
6. Applicants holding an undergraduate degree from foreign institutions must display an acceptable level of English proficiency by achieving a score of 250 on the computer-based TOEFL examination or 600 on the written version.
7. Additionally, successful applicants often have experience with shadowing genetic counselors and medical geneticists, interviewing genetic counselors and exposure to individuals with physical and cognitive disabilities. Exposure to crisis hotlines, support groups and community activities related to individuals with disability and genetic conditions is also helpful.

Note: The department receives an average of 120-150 applications annually. Of those, 40 to 50 are invited for an onsite interview, and eight to 10 students matriculate. The onsite interview is required for all North American applicants.

In the certification cycles from 2011-2016, graduates of the program have a 100 percent pass rate on the ABGC national certification examination.

The program participates in the Association of Genetic Counseling Program Directors program match. Prospective students may see the National Society of Genetic Counselors (http://www.nsgc.org/p/cm/ld/fid=44%23accept) website and the American Board of Genetic Counseling (http://www.abgc.net/ABGC/AmericanBoardofGeneticCounselors.asp) website for additional information.

Matriculating genetic counseling students are eligible for selection in the VA-LEND certificate in neurodevelopmental disabilities. Information is available at wp.vcu.edu/virginialend (https://rampages.us/virginialend1).

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum total of 60 credit hours. The program is a full-time, on-campus program. (Part-time on-campus options may exist at the discretion of the program director.) There is no online option for degree completion. Students are expected to complete their course work in four semesters (21 consecutive months). To be considered full-time, the VCU School of Medicine requires students to register for 15 credit hours in the fall and spring semesters. Occasionally special circumstances may occur that could require a temporary leave of absence. The VCU Graduate School requires that master's degrees be completed in a maximum of six years.

In order to be considered in good academic standing, a student must maintain a 3.0 GPA. Students who fail to maintain a 3.0 average are permitted one semester to bring their averages up to the required level.

As part of their course work, students begin clinical rotations in the spring semester of the first year and continue through the summer and both semesters of the second year. Students are required to engage in clinical experiences during the intervening summer. Options exist for summer experiences to occur outside the city of Richmond.

Students must pass a written comprehensive exam at the conclusion of the first two semesters of study and a written and oral comprehensive exam prior to graduation. The oral examination covers clinical competency and research competency.

Students are required to complete a research project during their course of study. The purpose of the research project is to give the student hands-on experience in developing a research question or exploring a professional or program problem, reviewing the literature, and attempting to answer the question or problem. Projects will enhance the student's professional development and represent a strong component of the "portfolio" of experience brought to the job interview process. Projects can range from laboratory to clinical and may include development of educational materials, videotapes or patient protocols. All projects are required to have defined goals and/or hypotheses to be tested. Institutional review board application and review is often required for student research. Publication and professional presentation are strongly encouraged.

Students are encouraged to consider projects in the first semester and to choose a project topic by the second semester. The project proposal is due to the program director by the first of June during the student's first year of study. All project proposals must be in writing and approved by the faculty member with whom the project will be performed and the program director. Some projects will require review by the Office of Research and Innovation for subject protections, and some projects may require that the student seek grant funding or participate on an existing faculty grant. The student is responsible for preparing documents and meeting these research requirements in a timely fashion.

Students must select a primary research adviser and the members of their research committee by the conclusion of the second semester. The committee must have at least one meeting by July 1 of the intervening summer. The research committee must include at least three faculty members with one outside of the department. Additional members may be added if needed for optimal project advising.

The student's supervisors and the genetic counseling program director work together in mentoring the student. Students are provided ongoing written and verbal evaluation regarding their academic and clinical progress.

In addition to participating in course work and counseling rotations, students in the department also participate in a number of community and education programs. These opportunities may include lectures and presentations to local schools and community events, participation in health fairs, School of Medicine-sponsored activities, state of Virginia Genetics Advisory Board meetings, and DNA Day on the Hill in Washington, D.C.

The straddling of the student and professional roles is a lifelong process in the changing field of human genetics and genetic counseling. Graduates of this program will be contributing members of the clinical genetics team of counselors, physicians and basic scientists and contributing members of commercial genetic testing laboratories and the developing field of human genomic medicine.

Curriculum requirements

Course	Title	Hours
ANAT 612	Human Embryology	2
HGEN 501	Introduction to Human Genetics	3
HGEN 502	Advanced Human Genetics	3
HGEN 510	Classic Papers in Human Genetics	1
HGEN 525 & HGEN 526	Practice of Genetic Counseling and Practice of Genetic Counseling	6
HGEN 527 & HGEN 528	Medical Genetics and Medical Genetics	6
HGEN 600	Clinical Genetics (course repeated three times as noted in plan of study)	9
HGEN 601	Research in Genetic Counseling	2
HGEN 607	Processes in Genetic Counseling I	1
HGEN 608	Processes in Genetic Counseling II	1
HGEN 615	Techniques in Genetic Counseling	3
HGEN 622	Cancer Genetic Counseling	3
HGEN 690	Genetics Research Seminar (repeated for four credits)	4
HGEN 697	Directed Research in Genetics (repeated for a minimum of eight credits) [1]	8
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
PATH 691	Special Topics in Modern Instrumental Methods (diagnostic genetic testing)	2
Electives (to be approved by the program director)		5
Total Hours		60

[1] One credit to be taken in the summer semester as noted in the plan of study.

Total graduate credit hours required (minimum) 60

Typical plan of study

Many students often take more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Healthcare Policy and Research, Doctor of Philosophy (Ph.D.)

Program goal

The doctoral program in healthcare policy and research trains students to understand the economic, political and social factors that affect access to care and the quality and cost of health care. Graduates of this program will have strong methodological and theoretical skills that will prepare them to make important contributions to the fields of health care policy and public health. Their training will enable them to add to scientific knowledge about how health policy, social factors, financing systems, organizational structures, care processes, health technologies and personal behaviors affect health care outcomes.

The program is structured to provide progressive mastery of the design and analysis of health services research. Program graduates will be able to formulate health care policy; to plan, implement and evaluate health programs and policies; and to interpret research findings in ways that are practical and policy-relevant to a variety of audiences. Trainees obtain experience working with colleagues in public health, medicine, psychology and other disciplines and to advance to positions as health policy researchers in academia, government or the private sector.

Student learning outcomes

1. Content and theory: Students will critically articulate how health policies are developed, implemented and evaluated.
2. Critical and analytical thinking: Students will accurately analyze and synthesize health policy research.
3. Research methods: Students will demonstrate proficiency in designing, conducting and interpreting health policy research.
4. Effective communication: Students will communicate effectively to translate and disseminate research findings for health policy audiences.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Enrolled students may access the program handbook on Blackboard.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 15 (Applications received prior to this date given priority consideration.)	GRE, TOEFL if international

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum qualifications.

1. A college-level course in calculus with a minimum grade of B preferred.
2. Applicants must have graduated from an accredited university or its equivalent, with a master's degree in a related discipline (e.g., economics, public health, public policy, health administration, public administration). Applicants must have completed relevant course work (including microeconomics and introductory statistics) or have professional experience in a health-related field (two years minimum) that provides an appropriate background for graduate-level study in healthcare policy and research.
3. Applicants must have taken the Graduate Record Exam within the past five years; scores in the 75th percentile preferred.
4. Applicants from countries where English is not the primary and official national language must complete one of the following:
   a. English proficiency verification through official TOEFL score 550 or higher
   b. Graduate with a master's degree following two years of study at a U.S. institution
   c. English language proficiency certification through appropriate English training programs at other U.S. institutions, or English language proficiency certification by passing the English Language Proficiency Examination and/or the corresponding English Language Institute courses

   VCU policy also requires that prospective students who have studied outside of the U.S. must provide an official WES or ECE external credential evaluation as a required part of the admissions process.
5. Applicants must present three letters of recommendation from individuals who are in a position to judge their ability to engage in interdisciplinary graduate study in healthcare policy and research. At least one recommendation must be from an individual who can comment on the applicant's academic qualifications (e.g., former instructor or adviser).
6. Applicants must provide a written statement of professional intent that includes the proposed area of research and identifies the faculty member(s) with which the applicant is interested in working.
7. Applicants must present a curriculum vitae or resume.
8. A recent writing sample, such as a first author, peer-reviewed publication; a master's thesis; a book chapter; a policy brief or report; or a graduate course paper is required. An undergraduate course paper may be substituted if none of the above is available.
9. Prospective students must be available to interview either in person or teleconference via technology such as Skype.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), a cumulative GPA of 3.0 must be maintained. Students must receive a minimum grade of B for all required courses. A student who receives a grade of C in a required course shall repeat the course. A second grade of C in a required course shall result in dismissal from the program. At the discretion of the HCPR committee, a student who is retaking a required course may still be eligible to take the comprehensive examination and to start the dissertation prior to repeating the course.

At the end of the second year of required course work, students will take a written comprehensive examination designed to evaluate the student's ability to:

1. Integrate course material
2. Demonstrate critical thinking and evaluation of the literature in health care policy and research
3. Demonstrate quantitative analysis skills

After passing the written comprehensive examination, the student will schedule the proposal defense within six months. Following successful defense of the proposal, the student will prepare three manuscripts of publishable quality that will comprise the body of the dissertation and will orally defend the dissertation. It is anticipated that students will complete the program in four to five years. All requirements for the Ph.D. degree must be completed within six years from the date of admission to the degree program. Extensions may be approved in extenuating circumstances.

Curriculum requirements

Required courses

Course	Title	Hours
ECON 501	Introduction to Econometrics (BIOS 553 may be substituted with approval)	3
ECON 612	Econometrics	3
ECON 642	Panel and Nonlinear Methods in Econometrics (BIOS 625, BIOS 631 or BIOS 647 may be substituted with approval)	3
EPID 571	Principles of Epidemiology (Replaces EPID 650)	3
HCPR 699	Departmental Seminar (one-credit course taken four times)	4
HCPR 701	Health Services Research and Policy I	3
HCPR 702	Health Services Research and Policy II	3
HCPR 703	Health Economics: Theory and Principles	3
HCPR 720	Economics of Health Disparities	3
HCPR 730	Survey Research Methods and Analysis for Health Policy	3
HCPR 732	Research Design and Proposal Preparation	3
HCPR 733	Statistical Methods in Analysis of Healthcare Research	3
HCPR 734	Economic Evaluation and Decision Analysis in Health	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		41

Research

Course	Title	Hours
HCPR 899	Directed Research (minimum nine credits)	9

Electives

Course	Title	Hours
Any graduate-level courses taken in consultation with an adviser.		9
Total Hours		9

Total graduate credit hours required (minimum) 59

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, the nature of research being conducted, or the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements. This program has a typical time to degree of four years. For additional information, see the departmental website (http://bulletin.vcu.edu/graduate/school-medicine/healthcare-policy-research-phd/%20http://hbp.vcu.edu/education/phd-healthcarepolicy).

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Program website: hbp.vcu.edu (http://hbp.vcu.edu)

Human Genetics, Doctor of Philosophy (Ph.D.)

Program goal

The program is designed to provide students with training in human and molecular genetics and with the skills required to advance to positions as researchers and trainers in a broad spectrum of positions in human and molecular genetics. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter in human and molecular genetics and an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in this discipline. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, the program will develop skills in the various means of communicating both the core of human and molecular genetics knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in research in human and molecular genetics, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Integrated knowledge of human and molecular genetics: The candidate will demonstrate an appropriate level of knowledge of the current elements of human and molecular genetics as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE

Special requirements

- International applicants must score 100 or greater on the TOEFL.
- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs, but not for dual degree academic programs.
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g., cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

The Department of Human and Molecular Genetics offers a comprehensive program in graduate study leading to a Doctor of Philosophy in Human Genetics. The program includes the completion of an original research project under the supervision of a faculty adviser and a background/foundation of courses that prepare students for research-oriented careers in the rapidly expanding field of human genetics. Major areas of study available to Ph.D. students in the program include clinical and molecular cytogenetics, molecular genetics, developmental genetics, cancer genetics, behavior genetics, population and quantitative genetics, genetic epidemiology, clinical genetics and genetic counseling. Once core course work requirements have been completed, the student's course plan is tailored to meet individual needs with regard to the area of research focus. A concentration in quantitative human genetics is available for those planning a career in this area. For more detailed information on the program visit the program website (https://gen.vcu.edu/graduate-and-training-programs/phd-in-human-genetics).

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 86 graduate credit hours. The program requires at least three years of study for students entering with a B.S. or B.A. degree and must be completed within eight years.

The training programs in human and molecular genetics are intended to set the tone for a career and lifelong learning in human and molecular genetics by developing the student's knowledge of the field and skills in writing, laboratory techniques, critical thinking, data interpretation, study design, literature research and review, and integration of data from multiple disciplines while fostering the student's development as an independent researcher, laboratory director or teacher. These programs also seek to provide students with a core foundation of knowledge that will equip them to carry out translational research and for later work leading to certification by the American Board of Medical Genetics.

Students working toward the Ph.D. degree in human genetics pass through two stages of graduate study. The first stage consists primarily of course work recommended by the department and the student's graduate committee; the second stage consists of original research leading to the doctoral dissertation. Ph.D. students are expected to complete the required course work within four semesters and one summer, and they are intended to set the tone of a lifelong research career. In order to be considered in good academic standing, a student must maintain a 3.0 grade point average. The focus then shifts to the student's development as an independent researcher with emphasis being placed upon the development and execution of an original research project leading to the doctoral dissertation.

After the second year of study, students will take the Ph.D. candidacy examination. This exam comprises two parts, a departmental comprehensive examination and a written NIH-style application with an oral examination administered by the student's graduate committee. Upon successfully completing the departmental comprehensive and the oral exam, the student is admitted to Ph.D. candidacy. At this point, students are expected to develop and conduct dissertation research projects and to write and defend their dissertations describing their dissertation research.

Curriculum requirements

Required courses

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or CCTR 702	Statistics for Genetic Studies I	

HGEN 501	Introduction to Human Genetics	3
HGEN 502	Advanced Human Genetics	3
HGEN 510	Classic Papers in Human Genetics	1
HGEN 606	Introduction to Clinical Genetics	1
HGEN 610	Current Literature in Human Molecular Genetics [1]	7
HGEN 611	Data Science I	3
HGEN 614	Pathogenesis of Human Genetic Disease	3
HGEN 690	Genetics Research Seminar [2]	8
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (two-credit course taken for three rotations)	6
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		40

Electives

Course	Title	Hours
Select at least two elective courses from the following:		5
PATH 670, courses at the 500-level or above in ANAT, BIOC, BIOL, BIOS, BNFO, HGEN, LFSC, MICR, NEUS, PHTX and PHIS excluding laboratory courses, courses specifically for professional programs (e.g. HGEN 600 Clinical Genetics), directed research, independent study, seminar, current topic courses, MICR 608 and MICR 609		
Total Hours		5

Directed research

Course	Title	Hours
HGEN 697	Directed Research in Genetics (1-15 variable credit hours) [3]	41

1 HGEN 610 should be taken every fall and spring semester beginning the spring term of the first year.

2 HGEN 690 should be taken every fall and spring semester.

3 HGEN 697 should be taken every semester following the first year of study.

Total graduate credit hours required (minimum) 86

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. The program requires at least three years of study for students entering with a B.S. or B.A. degree and must be completed within eight years. Students complete this degree program on average within five years. Students should refer to their program websites (https://gen.vcu.edu/graduate-and-training-programs/phd-in-human-genetics/curriculum) and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Human Genetics, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The doctoral curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The program centers on a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a doctoral dissertation.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred

3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)
7. Laboratory experience also strongly recommended

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 86 graduate credit hours.

During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Prior to the beginning of the third year of study, students should successfully pass written and oral candidacy examinations. Following completion of the research project and defense of the doctoral dissertation, graduates are equipped to participate in a broad range of current biomedical research areas.

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology [1]	5
BIOC 504	Biochemistry, Cell and Molecular Biology	1-5
BIOC 602	Physical Properties of Macromolecules (modules 1 and 2)	2
HGEN 501/BIOL 530	Introduction to Human Genetics	3
HGEN 602	Genetic Models of Disease	3
or HGEN 614	Pathogenesis of Human Genetic Disease	
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
IBMS 620	Laboratory/Clinical Rotations (three rotations)	6
Select one of the following (or an equivalent):		1
IBMS 630	Critical Thinking	
BIOC 691	Special Topics in Biochemistry	
HGEN 691	Special Topics in Genetics	
IBMS 680	Proposal Preparation	1
IBMS 690	Basic Health Sciences Research Seminar (first year only)	1
MICR 605	Prokaryotic Molecular Genetics	3
MICR 607	Techniques in Molecular Biology and Genetics	2
Take one credit in the following every semester beginning in the second year:		variable
MICR 690	Microbiology Research Seminar (section 002-MBG)	
Take the following course at least twice:		variable
MICR 693	Topics in Molecular Biology and Genetics	
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	

1

Students may complete the five-credit module sequence BIOC 530, BIOC 531, BIOC 532 and BIOC 533 in place of BIOC 503.

Directed research and electives

Course	Title	Hours
Select a variable number of credit hours of the following to amass the required minimum of 86 credit hours.		variable
HGEN 697	Directed Research in Genetics	
Electives		

Total graduate credit hours required (minimum) 86

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director

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Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Human Genetics, Doctor of Philosophy (Ph.D.) with a concentration in quantitative human genetics

Program goal

The program is designed to provide students with the skills required to advance to positions as researchers and trainers in a broad spectrum of positions in human and molecular genetics. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter in human and molecular genetics and an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in this discipline. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, the program will develop skills in the various means of communicating both the core

of human and molecular genetics knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in research in human and molecular genetics, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Integrated knowledge of human and molecular genetics: The candidate will demonstrate an appropriate level of knowledge of the current elements of human and molecular genetics as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE

Special requirements

- International applicants must score 100 or greater on the TOEFL.
- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs, but not for dual degree academic programs.
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5

2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

The Department of Human and Molecular Genetics offers a comprehensive program in graduate study leading to a Doctor of Philosophy in Human Genetics. The program includes the completion of an original research project under the supervision of a faculty adviser and a background/foundation of courses that prepare students for research-oriented careers in the rapidly expanding field of human genetics. Major areas of study available to Ph.D. students in the program include clinical and molecular cytogenetics, molecular genetics, developmental genetics, cancer genetics, behavior genetics, population and quantitative genetics, genetic epidemiology, clinical genetics and genetic counseling. Once core course work requirements have been completed, the student's course plan is tailored to meet individual needs with regard to the area of research focus. For more detailed information on the program visit the program website (https://gen.vcu.edu/graduate-and-training-programs/phd-in-human-genetics).

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 86 graduate credit hours. The program requires at least three years of study for students entering with a B.S. or B.A. degree and must be completed within eight years.

The training programs in human and molecular genetics are intended to set the tone for a career and lifelong learning in human and molecular genetics by developing the student's knowledge of the field and skills in writing, laboratory techniques, critical thinking, data interpretation, study design, literature research and review, and integration of data from multiple disciplines while fostering the student's development as an independent researcher, laboratory director or teacher. These programs also seek to provide students with a core foundation of knowledge that will equip them to carry out translational research and for later work leading to certification by the American Board of Medical Genetics.

Students working toward the Ph.D. degree in human genetics pass through two stages of graduate study. The first stage consists primarily of course work recommended by the department and the student's graduate committee; the second stage consists of original research leading to the doctoral dissertation. Ph.D. students are expected to complete the required course work within four semesters and one summer, and they are intended to set the tone of a lifelong research career. In order to be considered in good academic standing, a student must maintain a 3.0 grade point average. The focus then shifts to the student's development as an independent researcher with emphasis being placed upon the development and execution of an original research project leading to the doctoral dissertation.

After the second year of study, students will take the Ph.D. candidacy examination. This exam comprises two parts, a departmental comprehensive examination and a written NIH-style application with an oral examination administered by the student's graduate committee. Upon successfully completing the departmental comprehensive and the oral exam, the student is admitted to Ph.D. candidacy. At this point, students are expected to develop and conduct dissertation research projects and to write and defend their dissertations describing their dissertation research.

Curriculum requirements

Program core

Course	Title	Hours
ANAT 620	Scientific Writing and Grantsmanship	2
HGEN 501	Introduction to Human Genetics	3
CCTR 702	Statistics for Genetic Studies I	3
CCTR 703	Statistics for Genetic Studies II	3
HGEN 502	Advanced Human Genetics	3
HGEN 510	Classic Papers in Human Genetics	1
HGEN 603	Mathematical and Statistical Genetics	3
HGEN 606	Introduction to Clinical Genetics	1
HGEN 610	Current Literature in Human Molecular Genetics [1]	7
HGEN 611	Data Science I	3
HGEN 619	Quantitative Genetics	3
HGEN 690	Genetics Research Seminar [2]	8
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (two-credit course taken for three rotations)	6
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		48

Elective courses

Course	Title	Hours
Select at least two elective courses from the following:		5
PATH 670, courses at a 500-level or above in ANAT, BIOC, BIOL, BIOS, BNFO, HGEN, LFSC, MICR, NEUS, PHTX and PHIS excluding laboratory courses, courses specifically for professional programs (e.g. HGEN 600 Clinical Genetics), directed resarch, independent study, seminar, current topic courses, MICR 608 and MICR 609		
Total Hours		5

Directed research

Course	Title	Hours
HGEN 697	Directed Research in Genetics (1-15 variable credits) [3]	33

1

HGEN 610 should be taken every fall and spring semester beginning the spring term of the first year.

2

HGEN 690 should be taken every fall and spring semester.

3

HGEN 697 should be taken every semester following the first year of study.

Total graduate credit hours required (minimum) 86

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. The program requires at least three years of study for students entering with a B.S. or B.A. degree and must be completed within eight years. Students complete this degree program on average within five years. Students should refer to their program websites (https://gen.vcu.edu/graduate-and-training-programs/phd-in-human-genetics/curriculum) and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Human Genetics, Doctor of Philosophy (Ph.D.)/Genetic Counseling, Master of Science (M.S.) [dual degree]

Program accreditation
Accreditation Council of Genetic Counseling

Program goal

Provide training in human and molecular genetics and competency in genetic counseling

The program is designed to provide students with the skills required to advance to positions as researchers and trainers in a broad spectrum of positions in human and molecular genetics. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter in human and molecular genetics and an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in this discipline. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, the program will develop skills in the various means of communicating both the core of human and molecular genetics knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Eligibility for certification by the American Board of Genetic Counseling

To prepare individuals for careers in genetic counseling and human genetics, successful candidates will demonstrate competency in all four genetic counseling domains: I – genetics expertise and analysis; II – interpersonal, psychosocial and counseling skills; III – education; and IV – professional development and practice.

The Department of Human and Molecular Genetics offers training that combines preparation for a career as a genetic counselor with research-based doctoral training in a coordinated program that integrates the complementary aspects of these two degree categories. In order to be admitted to this dual-degree program, an applicant must be accepted into both the M.S. and Ph.D. programs.

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric. This is also achieved by evaluations of clinical rotations, both written and verbal, that are based on the competencies established by the American Board of Genetic Counseling and the scope of practice as set forth by the National Society of Genetic Counselors.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in research in human and molecular genetics, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Integrated knowledge of human and molecular genetics: The candidate will demonstrate an appropriate level of knowledge of the current elements of human and molecular genetics as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.
6. Competency in practice: The candidate should demonstrate development of competency in the responsible practice of genetic counseling. This will be assessed in the clinical setting by certified genetic counselors and medical geneticists. The assessment is based upon the core clinical competencies established by the the Accreditation Council for Genetic Counseling (ACGC). These competencies are documented with written and oral evaluations at

the completion of each of the seven clinical rotations by the rotation supervisor.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on master's programs is available in the Graduate Bulletin at Master's programs (p. 658); information on doctoral programs can be found at P (http://www.pubapps.vcu.edu/Bulletins/about/?uid=10046&iid=30114)h.D. programs (p. 654).

To qualify as a dual-degree student in any of the training paradigms which appear in the Bulletin, a student must have evidence of having been simultaneously enrolled in one or more courses of both of the programs constituting the "dual degree" for at least one semester.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D. and M.S.	Fall	Jan 15	GRE within five years of application (MCAT or DAT is not acceptable in lieu of GRE.)

Special requirements

- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form. The dual degree box on the application must also be checked.
- International applicants must score 100 or greater on the TOEFL.
- It is recommended that all prerequisite courses have been completed within 10 years of application.

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34). In order to be admitted to this dual-degree program, an applicant must apply to and be accepted into both the M.S. and the Ph.D. programs.

Human Genetics, Doctor of Philosophy

Successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

The Department of Human and Molecular Genetics offers a comprehensive program in graduate study leading to a Doctor of

Philosophy in Human Genetics. The program includes the completion of an original research project under the supervision of a faculty adviser and a background/foundation of courses that prepare students for research-oriented careers in the rapidly expanding field of human genetics. Major areas of study available to Ph.D. students in the program include clinical and molecular cytogenetics, molecular genetics, developmental genetics, cancer genetics, behavior genetics, population and quantitative genetics, genetic epidemiology, clinical genetics and genetic counseling. Once core course work requirements have been completed, the student's course plan is tailored to meet individual needs with regard to the area of research focus. A concentration in quantitative human genetics is available for those planning a career in this area. For more detailed information on the program visit gen.vcu.edu/graduate-programs/phd-in-human-genetics (http://gen.vcu.edu/graduate-programs/phd-in-human-genetics).

Genetic Counseling, Master of Science (M.S.)

Applicants should have successfully completed undergraduate training and hold a baccalaureate degree. Prerequisites for admission include six credit hours each of biology, chemistry and behavioral science (psychology, anthropology, sociology, religion and philosophy) and three credit hours each of biochemistry, statistics and genetics. Students accepted to the program are generally drawn from applicants with an undergraduate minimum grade point average of 3.0 (on a 4.0 scale or equivalent), with an average GPA of 3.3 to 3.5 for matriculating students. The Graduate Record Examination is required for admission; VCU does not substitute with the MCAT. Matriculating students generally have GRE verbal scores at or above 153, quantitative scores at or above 144 and a performance above a score of 3.5 on the analytical section. Applicants holding an undergraduate degree from foreign institutions must display an acceptable level of English proficiency by achieving a score of 250 on the computer-based TOEFL examination or 600 on the written version. (The program participates in the Association of Genetic Counseling Program Directors program match. Please see the National Society of Genetic Counselors website for information for prospective students at nsgc.org/p/cm/ld/fid=44#accept (http://nsgc.org/p/cm/ld/fid=44%23accept).)

Additionally, successful applicants often have experience with shadowing genetic counselors and medical geneticists, interviewing genetic counselors and exposure to individuals with physical and cognitive disabilities. Exposure to crises hotlines, support groups and community activities related to individuals with disability and genetic conditions is also helpful.

In the last five certification cycles (2007 to 2012) VCU graduates have an 86 percent pass rate on the American Board of Genetic Counseling/Accreditation Council of Genetic Counseling national certification examination.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the Ph.D. degree requires at least three years of study for students entering with a baccalaureate degree and must be completed within eight years. Students in the dual-degree program must complete a minimum of 90 graduate credit hours.

The training programs in human and molecular genetics are intended to set the tone for a career and lifelong learning in human and molecular genetics by developing the student's knowledge of the field and skills in writing, laboratory techniques, critical thinking, data interpretation, study design, literature research and review, and integration of data from multiple disciplines while fostering the student's development as an independent researcher, laboratory director or teacher. These programs also seek to provide students with a core foundation of knowledge that will equip them to carry out translational research and for later work leading to certification by the American Board of Medical Genetics.

Students working toward the Ph.D. degree in Human Genetics pass through two stages of graduate study. The first stage consists primarily of course work recommended by the department and the student's graduate committee; the second stage consists of original research leading to the doctoral dissertation. Ph.D. students are expected to complete the required course work within four semesters and one summer, and they are intended to set the tone of a lifelong research career. In order to be considered in good academic standing, a student must maintain a 3.0 grade point average. The focus then shifts to the student's development as an independent researcher with emphasis being placed upon the development and execution of an original research project leading to the doctoral dissertation.

After the second year of study, students will take the Ph.D. candidacy examination. This exam comprises two parts, a departmental comprehensive examination and a written NIH-style application with an oral examination administered by the student's graduate committee. Upon successfully completing the departmental comprehensive and the oral comprehensive exam, the student is admitted to Ph.D. candidacy. At this point, students are expected to develop and conduct dissertation research projects and to write and defend their dissertations describing their dissertation research.

Curriculum requirements

Course	Title	Hours
ANAT 612	Human Embryology [1]	2
ANAT 620	Scientific Writing and Grantsmanship [2,3]	2
BIOS 543	Graduate Research Methods I [3]	3
or CCTR 702	Statistics for Genetic Studies I	
HGEN 501	Introduction to Human Genetics [1,3]	3
HGEN 502	Advanced Human Genetics [1,3]	3
HGEN 510	Classic Papers in Human Genetics [1,3]	1
HGEN 525	Practice of Genetic Counseling [1]	3
HGEN 526	Practice of Genetic Counseling [1]	3
HGEN 527	Medical Genetics [1]	3
HGEN 528	Medical Genetics [1]	3
HGEN 600	Clinical Genetics (three credit hour course a minimum of five semesters) [1]	15
HGEN 607	Processes in Genetic Counseling I [1]	1
HGEN 608	Processes in Genetic Counseling II [1]	1
HGEN 610	Current Literature in Human Molecular Genetics [3,4]	7
HGEN 611	Data Science I [3]	3
HGEN 614	Pathogenesis of Human Genetic Disease [3]	3
or HGEN 603	Mathematical and Statistical Genetics	
HGEN 615	Techniques in Genetic Counseling [3]	3
HGEN 622	Cancer Genetic Counseling [1]	3
HGEN 690	Genetics Research Seminar [1,3,5]	8
HGEN 697	Directed Research in Genetics (variable 1-15 credits) [1,3,5]	10

IBMS 600	Laboratory Safety [3]	1
IBMS 620	Laboratory/Clinical Rotations (two-credit course taken for three rotations) [3]	6
OVPR 601	Scientific Integrity [1,3]	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
PATH 691	Special Topics in Modern Instrumental Methods [1]	2
Total Hours		90

[1]M.S. in Genetic Counseling requirement

[2]HGEN 614 fulfills this requirement

[3]Ph.D. in Human Genetics requirement

[4]HGEN 610 should be taken every fall and spring semester beginning the spring term of the first year but not required in the last year of study.

[5]HGEN 690 should be taken every fall and spring semester

[6]HGEN 697 should be taken every semester following the first year of study

[7]This course is divided into two distinct sections — a cytogenetics section and a molecular genetics section. The intent of this rotation is for students to learn the behind-the-scenes wet lab activities that lead to genetic information relevant for clinical counseling. Some dual-degree students may choose a thesis project that specializes in wet lab research, either cytogenetics or molecular genetics. With permission from the adviser and the genetic counseling program director, part or all of this rotation may not be required.

Electives (optional)

No electives are required for the dual-degree program. If the student chooses to take electives, however, suggested electives include the following:

Course	Title	Hours
Select 0-3 credits from IDDS 602, PATH 670, courses at the 500-level or above in ANAT, BIOC, BIOL, BIOS, BNFO, HGEN, LFSC, MICR, NEUS, PHTX and PHIS, excluding laboratory courses, courses specficially for professional programs, directed research, independent study, seminar, current topic courses, MICR 608 and MICR 609		0-3
Total Hours		0-3

Total graduate credit hours required (minimum) 90

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted or in the enrollment or funding status of the student. The program requires at least three years of study for students entering with a B.S. or B.A. degree and must be completed within eight years. Students complete these degree programs on average within six years. Students should refer to their program websites (https://gen.vcu.edu/graduate-and-training-programs/dual-degree-program-in-human-genetics--genetic-counseling) and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director

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Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Human Genetics, Master of Science (M.S.)

Program goal

The goal of the master's program in human genetics is to provide training in human and molecular genetics. The program is designed to provide students with the skills required to advance to positions as researchers and trainers in a broad spectrum of positions in human and molecular genetics. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter in human and molecular genetics and an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in this discipline. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, students will develop skills in the various means of communicating both the core of human and molecular genetics knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

4. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in research in human and molecular genetics, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Integrated knowledge of human and molecular genetics: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of human and molecular genetics as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1	GRE, MCAT or DAT

Special requirements

- International applicants must score 100 or greater on the TOEFL.

In addition to the general admission requirements of the VCU Graduate School (https://vcu-curr.courseleaf.com/graduate/study/admission-graduate-study/admission-requirements), applicants wishing to specialize in human genetics should have courses in biology, chemistry through organic chemistry, genetics and mathematics through calculus.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

The Department of Human and Molecular Genetics offers a comprehensive program in graduate study leading to a Master of Science in Human Genetics. The program includes the completion of an original research project under the supervision of a faculty adviser and a background/foundation of courses that prepare students for research-oriented careers in the rapidly expanding field of human genetics. Major areas of study available to master's students in the program include

clinical and molecular cytogenetics, molecular genetics, developmental genetics, cancer genetics, behavior genetics, population and quantitative genetics, genetic epidemiology, clinical genetics and genetic counseling.

In addition to the general VCU Graduate School graduation requirements (p. 31), the M.S. degree requires at least two years of full-time study for students entering with a B.S. or B.A. degree and must be completed within six years. Students must complete a minimum of 59 graduate credit hours. Students may be required to take an additional six hours of directed research after the second spring semester if needed.

Upon completing their thesis research, master's students must report their results in a thesis that is prepared in an acceptable form and style as detailed by the university Graduate School. A final oral examination is scheduled after the student's thesis has been approved by the student's advisory committee. This examination includes the subject matter of course work the student has completed as well as the thesis. It is administered by the student's graduate advisory committee who will vote on the student's performance in addition to rating them with regard to the rubrics defined by the School of Medicine.

Curriculum requirements

Required courses

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or CCTR 702	Statistics for Genetic Studies I	
HGEN 501	Introduction to Human Genetics	3
HGEN 502	Advanced Human Genetics	3
HGEN 510	Classic Papers in Human Genetics	1
HGEN 605	Experimental Methods in Human Genetics (variable credit; taken two semesters for a minimum of five credits) [1]	5
HGEN 610	Current Literature in Human Molecular Genetics [2]	3
HGEN 606	Introduction to Clinical Genetics	1
HGEN 611	Data Science I	3
HGEN 690	Genetics Research Seminar [3]	4
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		27

Electives

Course	Title	Hours
Select at least two elective courses from the following:		5
PATH 670; courses at the 500 level or above in ANAT, BIOC, BIOL, BIOS, BNFO, HGEN, LFSC, MICR, NEUS, PHTX and PHIS excluding laboratory courses; courses specifically for professional programs (e.g. HGEN 600); directed research; independent study; seminar; current topic courses; MICR 608 and MICR 609		
Total Hours		5

Directed research

Course	Title	Hours
HGEN 697	Directed Research in Genetics [4]	27

1

The student and faculty member will design a project that can reasonably be completed in 12 weeks. The student will spend approximately 12 weeks in that laboratory for a minimum of eight hours a week. The student's performance in the laboratory will serve as the basis for the grade that is received for this course.

2

HGEN 610 should be taken every fall and spring semester beginning the spring term of the first year

3

HGEN 690 should be taken every fall and spring semester

4

HGEN 697 should be taken every semester following the first year of study

Total graduate credit hours required (minimum) 59

Typical plan of study

The M.S. degree requires at least two years of full-time study for students entering with a B.S. or B.A. degree and must be completed within six years. Students complete this degree program on average within two years. Students should refer to their program websites (https://gen.vcu.edu/graduate-and-training-programs/ms-in-human-genetics/curriculum) and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Rita Shiang, Ph.D.
Associate professor, Department of Human and Molecular Genetics
rita.shiang@vcuhealth.org
(804) 628-4083

Additional contact
Michael S. Grotewiel, Ph.D.
Director of admissions
michael.grotewiel@vcuhealth.org
(804) 628-4086

Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Human Genetics, Master of Science (M.S.) with a concentration in genomic data science

Program goal

The genomic data science concentration is designed for students interested in the computational aspects of genetics and genomics research. The goal of this concentration is to provide students with training in broadly applicable analytical and computational skills from the emerging field of data science to address important questions in human and molecular genetics. The structure of the M.S. program provides a framework for the progressive development of a mastery of the current state of the subject matter in human and molecular genetics and an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in this discipline. The program relates the above framework to the development

of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, students will develop skills in the various means of communicating both the core of human and molecular genetics knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in research in human and molecular genetics, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. Integrated knowledge of human and molecular genetics: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of human and molecular genetics as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1	GRE, MCAT or DAT

Special requirements

- International applicants must score 100 or greater on the TOEFL.

In addition to the general admission requirements of the VCU Graduate School (https://vcu-curr.courseleaf.com/graduate/study/admission-graduate-study/admission-requirements), applicants wishing to specialize in human genetics should have courses in biology, genetics, statistics and mathematics through calculus.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert

with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

The Department of Human and Molecular Genetics offers a comprehensive program in graduate study leading to a Master of Science in Human Genetics. The program includes the completion of an original research project under the supervision of a faculty adviser and a background/foundation of courses that prepare students for research-oriented careers in the rapidly expanding field of human genetics. Major areas of study available to master's students in the program include clinical and molecular cytogenetics, molecular genetics, developmental genetics, cancer genetics, behavior genetics, population and quantitative genetics, genetic epidemiology, clinical genetics and genetic counseling.

In addition to the general VCU Graduate School graduation requirements (p. 31), the M.S. degree requires at least two years of full-time study for students entering with a B.S. or B.A. degree and must be completed within six years. Students must complete a minimum of 59 graduate credit hours. Students may be required to take an additional six hours of directed research after the second spring semester if needed.

Upon completing their thesis research, master's students must report their results in a thesis that is prepared in an acceptable form and style as detailed by the Graduate School. A final oral examination is scheduled after the student's thesis has been approved by the student's advisory committee. This examination includes the subject matter of course work the student has completed as well as the thesis. It is administered by the student's graduate advisory committee who will vote on the student's performance in addition to rating them with regard to the rubrics defined by the School of Medicine.

Required courses

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or CCTR 702	Statistics for Genetic Studies I	
BIOS 544	Graduate Research Methods II	3
or CCTR 703	Statistics for Genetic Studies II	
BIOS 567	Statistical Methods for High-throughput Genomics Data I	3
HGEN 501	Introduction to Human Genetics	3
HGEN 502	Advanced Human Genetics	3
HGEN 510	Classic Papers in Human Genetics	1
HGEN 603	Mathematical and Statistical Genetics	3
HGEN 605	Experimental Methods in Human Genetics (variable credit; taken two semesters for a minimum of five credits) [1]	5
HGEN 610	Current Literature in Human Molecular Genetics [2]	3
HGEN 611	Data Science I	3
HGEN 612	Data Science II	3
HGEN 690	Genetics Research Seminar [3]	4
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		38

Directed research

Course	Title	Hours
HGEN 697	Directed Research in Genetics [4]	21

1

The student and faculty member will design a project that can reasonably be completed in 12 weeks. The student will spend approximately 12 weeks in that laboratory for a minimum of eight hours a week. The student's performance in the laboratory will serve as the basis for the grade that is received for this course.

2

HGEN 610 should be taken every fall and spring semester beginning the spring term of the first year.

3

HGEN 690 should be taken every fall and spring semester.

4

HGEN 697 should be taken every semester following the first year of study.

Total graduate credit hours required (minimum) 59

Typical plan of study

The M.S. degree requires at least two years of full-time study for students entering with a B.S. or B.A. degree and must be completed within six years. Students complete this degree program on average within two years. Students should refer to their program websites (https://gen.vcu.edu/graduate-and-training-programs/ms-in-human-genetics/curriculum) and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director

Rita Shiang, Ph.D.
Associate professor, Department of Human and Molecular Genetics
rita.shiang@vcuhealth.org
(804) 628-4083

Additional contact

Michael S. Grotewiel, Ph.D.
Director of admissions
michael.grotewiel@vcuhealth.org
(804) 628-4086

Program website: gen.vcu.edu (http://www.gen.vcu.edu)

Human Genetics, Master of Science (M.S.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The master's curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology or provide the foundation for further graduate study toward a Ph.D.

It is expected that the program should be completed in approximately two to two-and-one-half years.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

A master's student in the MBG curriculum must prepare a formal written research plan and make an oral presentation of their thesis research proposal and progress report to their graduate advisory committee prior to the beginning of the second year of residency. The student's knowledge in the area of the proposed research, current research accomplishments and the feasibility of the proposed research project will

be evaluated by the GAC. Successful completion of this review is required for continuance in the program and constitutes admission to candidacy.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Deadline date rolling, preference given to applications received by Jan 17	GRE; TOEFL for applicants whose native language is not English

Special requirements

- Applications for the program should be submitted to Molecular Biology and Genetics – M.S. selected from the drop-down menu of programs of the VCU online graduate application form. The degree awarded will be a Master of Science in Human Genetics.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned or expect to earn a baccalaureate or equivalent degree, and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics. Laboratory experience is also strongly recommended. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals. International applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the interdisciplinary master's curriculum in molecular biology and genetics requires a minimum of 48 credit hours, at least half of which must be course work restricted to graduate students. The curriculum includes19 credit hours of required core course work and 29 additional credit hours of required course work, directed research and research seminar course work, and additional approved course work, as listed below. M.S. candidates must pass a final oral examination. A written thesis approved by the student's graduate advisory committee completes the requirements leading to the M.S. degree.

Curriculum requirements

Required core courses

Course	Title	Hours
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function [1]	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism [1]	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology [1]	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics [1]	1
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (sections 004 and 005; two credits taken twice) [2]	4
MICR 607	Techniques in Molecular Biology and Genetics	2
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club, must take at least once)	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	

OVPR 603	Responsible Conduct of Research	
Total Hours		19

[1]

This requirement may also be satisfied with BIOC 503 (five credit hours).

[2]

This requirement may also be satisfied, under certain circumstances, with MICR 608 or MICR 609 (three credit hours; section 002). Consult with the program director.

Other required course work (29 credits)

Course	Title	Hours
HGEN 501	Introduction to Human Genetics	3
Select a minimum of one credit hour of directed research every semester of enrollment in the program after the first year of study from:		variable
HGEN 697	Directed Research in Genetics	
or MICR 697	Directed Research in Microbiology	
Select a minimum of one credit hour of research seminar course work every fall and spring semester of enrollment in the program from:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG)	

Students may take additional course work with the approval of their graduate program directors.

Total graduate credit hours required (minimum) 48

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
Professor, Department of Microbiology and Immunology
christie@vcu.edu
(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Medical Physics, Certificate in (Post-baccalaureate graduate certificate)

Program accreditation
Commission on Accreditation of Medical Physics Educational Programs (http://campep.org)

Program goals

The graduate certificate in medical physics offers course work in physics as it is applied to the diagnosis and treatment of human diseases. Required course work provides theoretical and practical training in radiation dosimetry, radiation biology, radiation therapy, imaging and health physics. The goal of the program is to provide a career path in medical physics as an alternative to a terminal degree in medical physics. The program is primarily designed for retraining those who possess a doctoral degree in physics or a related field.

The mission of the medical physics graduate certificate program is to serve the Virginia and the nation by helping to meet the demand for competent medical physicists in the health care delivery setting. The program is intended for postdoctoral individuals seeking to enhance their credentials for admission into a medical physics residency position.

Student learning goals

To develop core competency in medical physics by:

1. Obtaining a medical physics knowledge base
2. Enhancing medical physics-specific problem-solving skills
3. Enhancing clinically relevant communication skills

Student learning outcomes

1. Demonstrate appropriate written communication skills
2. Demonstrate appropriate oral and visual communication skills
3. Demonstrate satisfactory knowledge of the base of scientific information required to practice clinical medical physics
4. Demonstrate the ability to evaluate and integrate such knowledge into the solution of clinically relevant problems as measured by the course work
5. Demonstrate an appropriate level of skill in the identification of clinical medical physics problems and the design and implementation of appropriate problem-solving methods and solutions as measured by course work

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's

faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The medical physics graduate program student handbook (https://medicalphysics.vcu.edu/handbook/StudentHandbook.pdf) is available on the Medical Physics website.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jan 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of Medicine, students are expected to satisfy the following minimum standards for admission.

1. Students must have a minimum of 30 credit hours in undergraduate physics, physical science or engineering, of which at least 18 credit hours must be at the upper level. Background courses should include calculus one and two, linear algebra, differential equations, modern physics, and electricity and magnetism physics.
2. Students must submit satisfactory GRE scores.
3. Applicants must present a minimum GPA of 3.0 on a 4-point scale for the undergraduate degree or most recently completed graduate degree
4. Doctorate degree in physics, engineering, or other area of physical science

Students are required to complete the 22 credit hours of the core graduate medical physics course work (MEDP 561, MEDP 563, MEDP 567, MEDP 601, MEDP 630, MEDP 635, MEDP 636) plus one credit hour of MEDP 689.

Curriculum requirements

Course	Title	Hours
MEDP 561	Topographical Anatomy and Physiology	1
MEDP 563	Radiological Physics and Radiation Dosimetry	4
MEDP 567	Introduction to Radiation Therapy Physics	3
MEDP 601	Health Physics	3
MEDP 630	Radiobiology for the Medical Physicist	3
MEDP 635	Physics of Diagnostic Imaging	3
MEDP 636	Physics of MRI	3
MEDP 637	Physics of Nuclear Medicine	2
MEDP 689	Medical Physics Literature Review	1
Total Hours		23

Total graduate course credit hours required (minimum) 23 credits

Graduate program director
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(804) 628-7780

Program website: medicalphysics.vcu.edu (http://www.medicalphysics.vcu.edu)

Medical Physics, Doctor of Philosophy (Ph.D.)

Program accreditation
Commission on Accreditation of Medical Physics Educational Programs (http://campep.org)

Program goals

The Ph.D. in Medical Physics offers students course work and research training in physics as it is applied to the diagnosis and treatment of human diseases. The mission of the doctoral program is to serve the commonwealth of Virginia and the nation by helping to meet the demand for competent medical physicists in both the health care delivery and biomedical research settings. The program will prepare students for careers as independent investigators in the field of medical physics and jointly for careers in university departments, research institutes, laboratories and hospitals as trainee clinical medical physicists. Research areas include brachytherapy, hyperthermia, image-guided radiation therapy, intensity-modulated radiation therapy, proton therapy, medical imaging technologies, radiomics, image processing and reconstructions, functional imaging, novel treatment device fabrications, robotics, and 4-D treatment technology development.

Professional competency: To develop professional competency in medical physics by providing a framework in which students progressively develop a mastery of the current state of medical physics

and an ability to synthesize this information and apply it in research and clinical settings. Additionally, the program aims to develop skills in the various means of communicating both the core of medical physics knowledge and expression of experimental design, results, and interpretation to a variety of potential audiences.

Scientific competency: To develop scientific competency in medical physics by providing a framework by which candidates develop skills to design, conduct and implement theoretical and clinical research which answers identified questions. The research focus may lead to new and/or improved applications of physics for diagnosis and treatment of diseases. In broad terms, candidate research will be directed toward advancing "minimally invasive medicine" through applications of ionizing and non-ionizing radiation.

Student learning outcomes

1. Communication skills: The candidate should demonstrate that an appropriate level of oral, written and visual communication skills have been acquired. The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric. The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
2. Experimental design: The candidate should demonstrate an appropriate level of skill in the theoretical and technical design of experimental procedures and the technical conduct of experimentation related to his or her research. This includes demonstration of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
3. Knowledge of medical physics literature: The candidate should demonstrate a general knowledge of medical physics literature and a more detailed knowledge of his or her area of research, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.
4. Problem-solving: The candidate should demonstrate an appropriate level of skill in the identification of meaningful medical physics research problems, including the ability to defend said identifications, and the design and implementation of appropriate problem-solving methods as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The medical physics graduate program student handbook (https://medicalphysics.vcu.edu/handbook/StudentHandbook.pdf) is available on the Medical Physics website.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on doctoral programs is available in the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of Medicine, students are expected to satisfy the following minimum standards for admission.

1. Students must have a minimum of 30 credit hours in undergraduate physics, physical science or engineering, of which at least 18 credit hours must be at the upper level. Background courses should include

calculus one and two, linear algebra, differential equations, modern physics, and electricity and magnetism physics.
2. Students must submit satisfactory GRE scores.
3. Applicants must present a minimum GPA of 3.0 on a 4-point scale for the undergraduate degree or most recently completed graduate degree.

Provisional admission may be granted where deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are designed to remove deficiencies will not be accepted for credit hours toward the graduate degree.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students entering the program with an undergraduate degree are required to earn a minimum of 30 credit hours in didactic or laboratory course work. Students entering with a master's degree in medical physics, physics or an appropriate related field are required to earn a minimum of 18 credit hours. In addition to course work, the Ph.D. requires a minimum of 12 credit hours in MEDP 697 Directed Research. At least half of the course work must be earned at the 600 level or higher. Detailed degree requirements are listed below and in the medical physics graduate handbook.

All new Ph.D. students entering the program will be assigned an adviser. After successful completion of the written comprehensive exam, students and advisers will develop a graduate dissertation committee. The committee will direct the students in their research and subsequent course selection. Advisers will report once a semester to the program director on the academic progress of their students and will administer the oral candidacy and dissertation defense examinations.

The student is required to complete written and oral examinations to be admitted as a Ph.D. candidate. The written comprehensive examination covers core knowledge and applications in medical physics course work, as well as basic concepts in physics, chemistry and biology. The oral examination, administered by the student's graduate dissertation committee, is based upon a written prospectus describing the proposed dissertation research project. Examiners evaluate the adequacy of the proposed project, the student's level of understanding of the project and the likelihood that the dissertation can be completed successfully.

After being approved for degree candidacy, the student must conduct substantial original investigation under the supervision of the advisers and must prepare a dissertation reporting the results of the research in the context of existing scientific knowledge. After the dissertation has been completed and unanimously accepted for defense by the graduate dissertation committee, the candidate will appear before the committee for an oral defense. The oral dissertation defense examines the candidate's research, dissertation documentation and underlying fundamental knowledge. Upon successful completion of the defense and dissertation, the student may apply for graduation with a Ph.D. in Medical Physics.

Curriculum requirements

Recommended core courses

Course	Title	Hours
MEDP 561	Topographical Anatomy and Physiology	1
MEDP 563	Radiological Physics and Radiation Dosimetry	4
MEDP 567	Introduction to Radiation Therapy Physics	3
MEDP 601	Health Physics	3
MEDP 630	Radiobiology for the Medical Physicist	3
MEDP 633	Advanced Radiation Therapy Physics	4
MEDP 635	Physics of Diagnostic Imaging	3
MEDP 636	Physics of MRI	3
MEDP 637	Physics of Nuclear Medicine	2
MEDP 689	Medical Physics Literature Review	1
Total Hours		27

Recommended electives

Course	Title	Hours
Select three credit hours from the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	
or STAT 544	Statistical Methods II	
MEDP 682	Clinical Rotations in Medical Physics (variable credits, may be repeated)	
STAT 641	Applied Data Analysis	
Select only one of the following:		
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		3

Directed research

Course	Title	Hours
MEDP 697	Directed Research (minimum of 12 credits)	12

Total graduate credit hours required (minimum) 42

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study, or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

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kmgoracke@vcu.edu
(804) 628-7780

Program website: medicalphysics.vcu.edu (http://www.medicalphysics.vcu.edu)

Medical Physics, Master of Science (M.S.)

Program accreditation
Commission on Accreditation of Medical Physics Educational Programs (http://campep.org)

Program goals

The Master of Science in Medical Physics offers students course work and practical clinical training in physics as it is applied to the diagnosis and treatment of human diseases. The mission of the master's program is to serve the commonwealth of Virginia and the nation by helping to meet the demand for competent medical physicists in the health care delivery setting. The program will prepare students for careers as qualified and independent clinical medical physicists. Required course work provides theoretical and practical training in radiation dosimetry, radiation biology, radiation therapy, medical imaging and health physics.

Professional competency: To develop professional competency in medical physics by providing a framework in which students progressively develop mastery of the current state of medical physics and an ability to synthesize this information and apply it in a clinical setting. Additionally, students in the program will develop skills in the various means of communicating the core of medical physics knowledge and clinical applications of that knowledge to a variety of potential audiences.

Clinical competency: To develop clinically competent medical physics graduates by providing a framework in which students progress from didactic knowledge to clinical knowledge and demonstrate application of clinical medical physics principles, practices and procedures.

Student learning outcomes

1. Clinical performance: The candidate should demonstrate an appropriate level of skill in the theoretical, practical and technical conduct of medical physics in the clinical setting. This includes demonstration of an appropriate level of competence in the ability to:
   a. Design and quality assure radiation therapy treatment plans for both brachytherapy and external beam radiation therapy
   b. Quality assure radiation therapy delivery devices
   c. Quality assure radiation therapy treatment charts
   d. Perform calibration and/or beam delivery commissioning measurements as measured by instructor evaluation in compliance with accepted clinical standards
2. Communication skills: The candidate should demonstrate that an appropriate level of oral, written and visual communication skills have been acquired. The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by course work and performance on the written comprehensive examination. The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling, chart notation and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by course work and performance on the written comprehensive examination.
3. Medical physics knowledge base: The candidate should demonstrate satisfactory knowledge of the base of scientific information required to practice clinical medical physics. This includes general knowledge of medical physics scientific materials, clinical policies and procedures, and translational scientific literature. The student should demonstrate the ability to evaluate and integrate such knowledge into the solution of clinical problems as measured by course work and performance on the written comprehensive examination.
4. Problem-solving: The candidate should demonstrate an appropriate level of skill in the identification of clinical medical physics problems and the design and implementation of appropriate problem-solving methods and solutions as measured by course work, annual review and performance on the written comprehensive examination.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The medical physics graduate program student handbook (https://medicalphysics.vcu.edu/handbook/StudentHandbook.pdf) is available on the Medical Physics website.

School of Medicine graduate program policies
The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on master's programs (p. 658) is available in the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jan 15	GRE

In addition to the general admission requirements of the VCU Graduate School (p. 34) and the School of Medicine, students are expected to satisfy the following minimum standards for admission.

1. Students must have a minimum of 30 credit hours in undergraduate physics, physical science or engineering, of which at least 18 credit hours must be at the upper level. Background courses should include calculus one and two, linear algebra, differential equations, modern physics, and electricity and magnetism physics.
2. Students must submit satisfactory GRE scores.
3. Applicants must present a minimum GPA of 3.0 on a 4-point scale for the undergraduate degree or most recently completed graduate degree.

Provisional admission may be granted where deficiencies exist. These deficiencies must be removed by the end of the first year of residence, or its part-time equivalent, when the student's application will be re-examined. Courses that are designed to remove deficiencies will not be accepted for credit hours toward the graduate degree.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students entering the program with an undergraduate degree are required to earn a minimum of 30 credit hours in didactic or laboratory course work. At least 15 credit hours must be earned at the 600 level or higher. Detailed degree requirements are listed in the medical physics graduate handbook.

Students are required to complete 21 credit hours of core graduate medical physics course work

Course	Title	Hours
MEDP 563	Radiological Physics and Radiation Dosimetry	4
MEDP 567	Introduction to Radiation Therapy Physics	3
MEDP 601	Health Physics	3
MEDP 630	Radiobiology for the Medical Physicist	3
MEDP 635	Physics of Diagnostic Imaging	3
MEDP 636	Physics of MRI	3
MEDP 637	Physics of Nuclear Medicine	2
MEDP 682	Clinical Rotations in Medical Physics (repeated for six credit hours)	6
MEDP 689	Medical Physics Literature Review	1

Additionally, students also must demonstrate competence in anatomy through completion of an undergraduate or graduate anatomy course approved by the medical physics graduate curriculum committee.

Following completion of course work, students will be required to pass a comprehensive examination administered by the medical physics comprehensive examination committee. The comprehensive examination will cover materials from the core medical physics courses and clinical rotations.

Curriculum requirements

Course	Title	Hours
MEDP 561	Topographical Anatomy and Physiology	1
MEDP 563	Radiological Physics and Radiation Dosimetry	4
MEDP 567	Introduction to Radiation Therapy Physics	3
MEDP 601	Health Physics	3
MEDP 630	Radiobiology for the Medical Physicist	3
MEDP 635	Physics of Diagnostic Imaging	3
MEDP 636	Physics of MRI	3
MEDP 637	Physics of Nuclear Medicine	2
MEDP 682	Clinical Rotations in Medical Physics (repeated for six credit hours)	6
MEDP 689	Medical Physics Literature Review	1
Total Hours		29

Recommended electives

Course	Title	Hours
Select a minimum of one credit hour from the following:		1
MEDP 633	Advanced Radiation Therapy Physics	
MEDP 697	Directed Research (variable credits)	
OVPR 602	Responsible Scientific Conduct	
STAT 543	Statistical Methods I	
or BIOS 543	Graduate Research Methods I	
STAT 544	Statistical Methods II	
or BIOS 544	Graduate Research Methods II	
STAT 641	Applied Data Analysis	
Total Hours		1

Total graduate course credit hours required (minimum) 30

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study, or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contact
Katie Goracke
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Program website: medicalphysics.vcu.edu (http://www.medicalphysics.vcu.edu)

Medicine, Doctor of (M.D.)/Public Health, Master of (M.P.H.) [combined]

Program accreditation
Liaison Committee on Medical Education (M.D.)
Council on Education for Public Health (M.P.H.)

To qualify as a dual-degree student in any of the training paradigms which appear in the Bulletin, a student must have evidence of having been simultaneously enrolled in one or more courses of both of the programs constituting the “dual degree” for at least one semester.

Program goal

The Division of Epidemiology in the Department of Family Medicine and Population Health in the School of Medicine offers a program for VCU medical students to obtain a Master of Public Health degree in conjunction with their medical training. The M.D./M.P.H. combined-degree program provides an opportunity for medical students who wish to pursue a public health or research career to graduate from medical school trained in both clinical and preventive, population-oriented medicine. Graduates from this program are prepared for positions in preventive medicine, primary care, research, community-based health centers and state and local health departments. To meet degree requirements, students complete a minimum of 36 credit hours of M.P.H. course work that includes:

- 12 credits of core courses
- 12 credits of required courses
- Nine credits of electives
- Three credits of a capstone project

Note that some elective courses may not be available in certain years or may require instructor permission for registration.

The objective of the combined program is to provide high quality and in-depth training in public health to qualified medical students. The five-year program includes four years of medical school and one year of study in the M.P.H. program. Students enter the M.P.H. curriculum after the M-3 year. During the M.P.H. year, students take a minimum of 36 credit hours of course work. Students receive three credit hours for successful completion of the "Population Health" course in medical school and take a minimum of one public health elective during the M-4 year to satisfy the public health internship requirement.

Note: Enrollment in the dual-degree program requires admission into both the School of Medicine and the Graduate School. Students must successfully complete all required course work to receive both degrees at the end of the five years.

The mission of the M.P.H. program is to engage students in an experiential, learner-centered environment, collaborate with public health partners in Central Virginia to promote health equity and community wellness, and foster lifelong inquiry and discovery in interdisciplinary, translational research that improves human health.

The overall goal of the M.P.H. program is to educate students to become well-grounded in the essential knowledge, skills and attitudes of public health and demonstrate their ability to apply these essentials through course work, internships and the M.P.H. capstone project. This program is designed to provide students with the skills required to advance to positions as public health practitioners in a broad spectrum of positions and settings and who can perform the following:

1. Administer public health programs
2. Collect, analyze and evaluate public health data
3. Plan, implement and evaluate public health interventions
4. Apply results of evaluations and data analyses to policy development as necessary
5. Promote public health through educational campaigns

The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of public health and an ability to synthesize and apply this information to the identification of key areas of practice and research in public health. Students will develop educational competencies outlined by the M.P.H. program. These competencies cover the foundational knowledge necessary for a public health practitioner to both communicate the core of public health knowledge and express the design, results and interpretation of various public health interventions, evaluations, and data collection and analysis efforts to a variety of potential audiences.

Student learning outcomes

Student learning outcomes are monitored by the program faculty and center primarily around competencies for all students. Overall learning outcomes are as follows.

1. Integrated knowledge of public health: Students will demonstrate knowledge of the current elements of public health, at a level assessed by program faculty as competent or higher, according to the program rubric.
2. Demonstration of focused knowledge and skills: Students will demonstrate more detailed knowledge and applied skills in the individual area of scholarship, including familiarity with the research literature and the ability to evaluate and critique publications, at a level assessed by program faculty as competent or higher, according to the program rubric.
3. Development of competencies: Through program course work and applied experiences, students will develop competence in the discipline of public health as demonstrated through annual self-assessment of performance on the M.P.H. program competencies and faculty assessment of (1) student competence in semi-annual student reviews and (2) student performance in the program’s integrated learning experience, the capstone project.
4. Training in appropriate public health skills/knowledge: Through didactic study and two separate applied experiences in professional public health settings, students will gain knowledge and skills required to perform as public health practitioners and/or researchers.

The M.P.H. program trains students to develop educational competencies established by the program’s accrediting body, the Council on Education

for Public Health. These competencies may be viewed at http://familymedicine.vcu.edu/epidemiology/mph/competencies/.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The M.P.H. program student handbook is available upon request.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

For the M.P.H., apply online at sophas.org (http://www.sophas.org)**.** Submit a VCU supplemental application following the instructions available at sophas.org.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.D. and M.P.H.	Fall	Applications strongly encouraged by Mar 15	MCAT (acceptable in lieu of GRE scores for this combined professional/academic degree program) TOEFL

Note: Students applying to the combined M.D./M.P.H. program should be accepted to the VCU School of Medicine prior to applying to the M.D./M.P.H. Program. Students must apply separately to each program. Applications to the M.P.H. program are made through sophas.org.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must present the following qualifications.

1. Prior degree: Students must hold a bachelor's degree from an accredited institution, with a minimum GPA of 3.0 on a 4.0 scale in all undergraduate and any other graduate study. Official copies of transcripts for all prior degrees earned must be submitted to the VCU Office of Graduate Admissions.
2. Test scores: The M.P.H. program normally requires GRE scores, but for the combined M.D./M.P.H., students may submit MCAT scores provided for admission to the School of Medicine in lieu of GRE scores.
3. TOEFL: International students must submit TOEFL or IELTS scores. Minimum TOEFL score is 600 (paper-based), 250 (computer-based) or 100 (Internet-based); IELTS minimum score is 7.0. Test score requirements may be waived for international students who have received a medical degree (M.D.) in the U.S. Contact the program coordinator for more information. The PTE is also accepted with a minimum score of 65.

Students must also submit the following materials with their applications:

1. Letters of recommendation from three individuals who can assess applicant qualifications for graduate school; at least one academic reference is required, but two are preferred. Most appropriate are letters from past professors or work supervisors.
2. Current version of curriculum vitae or resume. Include experience and/or education relevant to study in public health.
3. Personal statement addressing the following issues:
   - What applicant plans to do in the first few years after graduation
   - Why VCU's M.P.H. program best fits the student's public health interests
   - Description of applicant's particular areas of interest in public health (e.g., maternal and child health, epidemiology)

- How an M.P.H. degree will help the applicant achieve her/his career goals
- Why the applicant wishes to pursue an M.P.H. degree
- Description of the applicant's career goals

Degree requirements

The Master of Public Health program prepares students committed to public health careers in the public, private or nonprofit sectors. Public health works to prevent health problems in populations before these problems occur. The M.P.H. provides a rigorous curriculum to help students develop the analytic and critical reasoning skills to improve population health. The program boasts experiential learning, a highly interactive environment, accessible and approachable faculty and student involvement in important projects.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to successfully complete minimum of 36 credit hours of formal course work and practicum, a 20-hour community-based learning experience, attendance at 12 public health seminars, and a capstone project. In addition, medical students will complete a public health elective during the M-4 year at a placement approved by the M.P.H. program director, in lieu of the required public health internship.

The M.P.H. program can be individualized to meet the varied needs and interests of students. The program offers many electives, allowing students to tailor the program to meet educational objectives, and it is flexible enough to accommodate students who enter the program with various backgrounds and experiences.

Capstone project: The culminating work in the M.P.H. program is the capstone project. The project is a practical experience that allows the student to apply what has been learned in the didactic components of the curriculum to a focused project. The goal is to enhance the student's academic experience through the application of public health concepts and skills in a supervised experience. Students are required to synthesize the literature; analyze, assess or evaluate quantitative or qualitative data; and in general apply theory and integrate knowledge gained and principles in situations that approximate some aspects of professional practice. With this mentored experience, students are able to both broaden their skills and hone their proficiency in a specific area of public health. The major product of this culminating experience is expected to vary depending on the educational goals of the student, but could include one of the following:

1. Manuscript suitable for publication in a peer-reviewed journal
2. Comprehensive disease-related report and analysis
3. Policy analysis report
4. Needs assessment for a specific population
5. Development, implementation, and analysis of target population surveys
6. Program evaluation

At a minimum, the capstone experience will require the integration of multiple major competencies used by a public health professional. In fulfilling the capstone requirement, each candidate must: (a) submit a formal written paper of sufficient depth and rigor and (b) satisfactorily complete a poster presentation of the project chosen as the basis for the written paper at an appropriate venue (e.g., research forum, refereed conference, etc.) approved by the M.P.H. program director.

Noncurricular program requirements

In addition to course work, students are required to complete the following noncurricular requirements for the M.P.H. degree:

1. Attendance at 12 public health seminars
2. Twenty hours of community-based service-learning

M.P.H. curriculum requirements for the combined M.D./M.P.H. program

Course	Title	Hours
Core courses		
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 548	Applied Data Analysis Lab II	1.5
EPID 604	Principles of Environmental Health	3
EPID 580	Public Health Ethics	1
EPID 593	Foundations of the Public Health Profession	2
EPID 594	MPH Practicum	2
HCPR 601	Introduction to Health Policy	3
OVPR 603	Responsible Conduct of Research	1
SBHD 605	Introduction to Social and Behavioral Health (Additional Program Courses)	3
Additional program courses		
Electives		
Select nine credit hours minimum from the following:		9
BIOS 549	Spatial Data Analysis	
BIOS 571	Clinical Trials	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
EPID 571	Principles of Epidemiology	
EPID 600	Introduction to Public Health	
EPID 601	Contemporary Issues and Controversies in Public Health	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
EPID 622	Maternal and Child Health	
EPID 624	Chronic Disease Epidemiology	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 692	Independent Study	
GRAD 614	Introduction to Grant Writing	
GRTY 501	Physiological Aging	
GRTY 510	Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
HEMS 505	Contemporary Issues in Health	
HEMS 550	Exercise, Nutrition and Weight Management	
HEMS 604	Nutrition for Health and Physical Activity	
HEMS 605	Psychology of Physical Activity	

HEMS 606	Psychosocial Aspects of Sport and Physical Activity	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
PSYC 660	Health Psychology	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
SBHD 609	Research Methods in Social and Behavioral Health I	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
SBHD 632	Health Disparities and Social Justice	
SBHD 634	Patient-Provider Interaction	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	
SBHD 638	Applications in Qualitative Research Methods	
SOCY 510	Domestic and Sexual Violence in Social Context	
SOCY 524	Aging and the Minority Community	
SOCY 603	Seminar in Population Studies	
SOCY 607	Seminar in Racial and Ethnic Relations in America	
SOCY 611	Studies in the Community	
SOCY 620	Seminar in Criminology	
SOCY 624	Community and Community Services for the Elderly	
SOCY 632	Intimate Partner and Sexual Violence: Medical Practice and Policy	
SOCY 633	Application of the Policy Process to Issues of Violence	
SOCY 634	Social Contexts of Childhood and Violence	
SOCY 635	Theorizing Gender Violence	
SOCY 645	The Sociology of Health and Illness	
URSP 521	Introduction to Geographic Information Systems	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 625	Spatial Database Management and GIS Modeling	
Integrative program requirements		
EPID 694	MPH Capstone Project	3
Noncurricular program requirements		
In addition to course work, students must attend 12 public health seminars and complete 20 hours of community-based service-learning.		
Total Hours		36

Sample plan of study for combined program

Fall semester		**Hours**
After M-3 training		
BIOS 543	Graduate Research Methods I	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 580	Public Health Ethics	1
EPID 593	Foundations of the Public Health Profession	2
HCPR 601	Introduction to Health Policy	3
OVPR 603	Responsible Conduct of Research	1
Electives (See list above)		6
	Term Hours:	17.5
Spring semester		
After M-3 training		
BIOS 544	Graduate Research Methods II	3
EPID 548	Applied Data Analysis Lab II	1.5
EPID 594	MPH Practicum	2
EPID 604	Principles of Environmental Health	3
EPID 694	MPH Capstone Project [1]	3
SBHD 605	Introduction to Social and Behavioral Health	3
Electives (See list above)		3
	Term Hours:	18.5
	Total Hours:	36

[1] Student may elect to complete 1-3 credits of EPID 694 in summer.

Total graduate credit hours required (minimum) 36

Selected course work completed during the M-1 and M-2 years of study for application toward the M.D. accounts for 9 credit hours toward the M.P.H. degree. This includes a substitution of training in population health in the M.D. curriculum for the core epidemiology course, EPID 571. The public health internship requirement is fulfilled through completion of a public health elective in the M-4 year, after the student completes the M.P.H. year. This elective occurs at a public health agency that is approved by the M.P.H. program director.

Graduate program director

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Program website: familymedicine.vcu.edu/epidemiology/mph/dual-degrees/ (http://familymedicine.vcu.edu/epidemiology/mph/dual-degrees)

Microbiology and Immunology, Doctor of Philosophy (Ph.D.)

Program goal

The graduate programs of the Department of Microbiology and Immunology in the School of Medicine include degrees offered at the master's and doctoral levels. These educational programs have as their mission the preparation of individuals for a variety of career objectives in microbiology and immunology. The programs incorporate formal instructional activities and, as appropriate, research training, mentored by the members of the faculty. The M.S. program is distinguished by inclusion of the preparation of the individual to function as a laboratory director or scientific investigator.

The Ph.D. program is designed to provide students with the skills required to advance to positions as bioscience researchers and trainers in a broad spectrum of positions. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches that address the questions identified.

The Ph.D. program is also designed to develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. General knowledge of science: The candidate should demonstrate a general knowledge of the elements of the sciences as related to molecular/cellular bioscience and a detailed knowledge of his or her area of research, including an appropriate familiarity with the research literature.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE or MCAT

Special requirements

- MCAT acceptable in lieu of GRE for combined professional/ academic degree programs
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. GRE scores greater than 153 for quantitative, 156 for verbal (or combined 1250 on previous scale) and 4.0 analytical scores
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 58 graduate credit hours. At least six credits must come from didactic 600-level courses.

The Department of Microbiology and Immunology has an outstanding faculty with diverse research interests that include cell and molecular biology, molecular genetics, molecular pathogenesis, bacteriology, immunology, immunotoxicology, virology, parasitology, mycology and oncology. The goal of the graduate program is to prepare students to become creative problem-solvers and leaders in scientific research. The Ph.D. degree is offered, as well as an M.D./Ph.D. degree for medical students interested in academic or research careers.

The research experience is complemented with excellent course offerings, seminar programs, teaching opportunities, presentations at scientific meetings, writing of a grant application and writing of scientific papers. Graduate students acquire a wide range of research experience in the first year through exposure to a variety of research laboratories and investigators. The student chooses a research adviser, undergoes a written and oral examination and then carries out an original independent research project under the direction of the adviser. The project falls under the review of an advisory committee, and a written dissertation is defended in a final oral examination.

A cumulative GPA of 3.0 (with no more than six credit hours of a C grade) is required to continue in the program.

Curriculum requirements

Note: First-year Ph.D. students in the Biomedical Sciences Doctoral Portal must earn a minimum of seven credits of didactic courses in the fall semester in order to be eligible to matriculate into the Department of Microbiology and Immunology without being on academic probation. Three of these credits must come from MICR 505 or MICR 515.

Course	Title	Hours
Didactic foundation		
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
MICR 505	Immunobiology	3
MICR 515	Principles of Molecular Microbiology	3
Non-didactic foundation		
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (three rotations)	6
MICR 690	Microbiology Research Seminar (taken each fall and spring semester; minimum eight credits)	8
Advanced microbiology and immunology course		
Select at least one of the following (satisfies three credits of six-credit 600-level didactic requirement):		3
MICR 605	Prokaryotic Molecular Genetics	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis [1]	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis [1]	
MICR 686	Advanced Immunobiology [2]	
Journal club		
Select one of the following journal club courses for one semester every year (four credits minimum).		4
MICR 692	Current Topics in Molecular Pathogenesis	
MICR 693	Topics in Molecular Biology and Genetics	
MICR 694	Current Topics in Immunology	
Responsible research and critical thinking		
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Electives and directed research		
Select credits in directed research and additional elective courses from the following list to amass the required minimum of 58 credit hours from the following:		19
MICR 607	Techniques in Molecular Biology and Genetics	

MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
MICR 684	Molecular Biology of Cancer	
MICR 697	Directed Research in Microbiology	
Total Hours		58

[1]

Offered in alternate years

[2]

May be repeated with different content to satisfy the six-credit 600-level didactic requirement.

Total graduate credit hours required (minimum) 58

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Program website: vcu.edu/micro (http://www.vcu.edu/micro)

Microbiology and Immunology, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The doctoral curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The program centers on a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a doctoral dissertation.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)
7. Laboratory experience also strongly recommended

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 58 graduate credit hours.

During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Prior to the beginning of the third year of study, students should successfully pass written and oral candidacy examinations. Following completion of the research project and defense of the doctoral dissertation, graduates are equipped to participate in a broad range of current biomedical research areas.

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology [1]	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 602	Physical Properties of Macromolecules (modules 1 and 2)	2
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
IBMS 620	Laboratory/Clinical Rotations (three rotations)	6
Select one of the following (or an equivalent):		1
IBMS 630	Critical Thinking	
BIOC 691	Special Topics in Biochemistry	
HGEN 691	Special Topics in Genetics	
IBMS 680	Proposal Preparation	1
IBMS 690	Basic Health Sciences Research Seminar (first year)	1
MICR 605	Prokaryotic Molecular Genetics	3
MICR 607	Techniques in Molecular Biology and Genetics	2
Take one credit the following every semester beginning in the second year:		variable
MICR 690	Microbiology Research Seminar (section 002 – MBG)	
Take the following course at least twice:		variable
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club - must take at least twice)	
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	

[1]

Students may complete the five-credit module sequence BIOC 530, BIOC 531, BIOC 532 and BIOC 533 in place of BIOC 503.

Eukaryotic molecular biology course

Course	Title	Hours
Select one course in eukaryotic molecular biology from the following list of approved options (or an approved alternative):		3
BIOC 605	Molecular Biology	
HGEN 602	Genetic Models of Disease	
HGEN 614	Pathogenesis of Human Genetic Disease	
IBMS 635	Cellular Signalling	
MICR 684	Molecular Biology of Cancer	
PATH 670	Experimental Approaches to Tumor Biology	
Total Hours		3

Directed research and electives

Course	Title	Hours
Select a variable number of credit hours of the following to amass the required minimum of 58 credit hours.		variable
MICR 697	Directed Research in Microbiology	
Electives		

Total graduate credit hours required (minimum) 58

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
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(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Microbiology and Immunology, Master of Science (M.S.)

Program goals

The graduate programs of the Department of Microbiology and Immunology in the School of Medicine include degrees offered at the master's and doctoral levels. These educational programs have as their mission the preparation of individuals for a variety of career objectives in microbiology and immunology. The programs incorporate formal instructional activities and, as appropriate, research training, mentored by the members of the faculty. The M.S. program is distinguished by inclusion of the preparation of the individual to function as a laboratory director or scientific investigator.

1. The program is designed to provide students with the skills required to advance to positions as bioscience researchers and trainers in a broad spectrum of positions.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation/experimentation in bioscience.
3. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
4. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research,

including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

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Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, DAT or MCAT

Special requirements

- Successful domestic applicants typically have GRE scores of at least 156 for verbal reasoning and 153 for quantitative reasoning, 4.0 for analytical reasoning; DAT score of 18 or greater; or MCAT score of 26 or greater. International applicants should display English language proficiency by achieving a TOEFL score of 100 (iBT) or higher.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum requirements.

1. Applicants must have earned or expect a baccalaureate or equivalent degree and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics.
2. Laboratory experience is strongly recommended.
3. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals.
4. For combined degree students, the Medical College Admission Test or Dental Aptitude Test is accepted in lieu of the GRE.
5. Foreign applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Complete application portfolio reviews will begin in January and will continue through May 1. International students requiring temporary U.S. visas should apply by April 1 for fall matriculation.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option

builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

The Department of Microbiology and Immunology has an outstanding faculty with diverse research interests that include cell and molecular biology, molecular genetics, molecular pathogenesis, bacteriology, immunology, immunotoxicology, virology, parasitology, mycology and oncology. The goal of the graduate program is to prepare students to become creative problem-solvers and leaders in scientific research. The Master of Science degree is offered, as well as a Ph.D. and an M.D./Ph.D. degree for medical students interested in academic or research careers.

The research experience is complemented with excellent course offerings, seminar programs, teaching opportunities, presentations at scientific meetings and writing scientific papers. Graduate students acquire a wide range of research experience in the first year through exposure to a variety of research laboratories and investigators. The student chooses a research adviser and then carries out an original, independent research project under the direction of the adviser. The project falls under the review of an advisory committee and a written dissertation is defended in a final oral examination.

M.S. students will select their permanent advisers after three rotations completed during the first year of study. Research projects will be based on ongoing research in laboratories of the selected permanent adviser. A graduate advisory committee will be developed by the student and adviser. The M.S. student and the GAC will formulate a suitable curriculum of study based on the student's area of research interest.

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the M.S. degree program must complete a minimum of 41 credit hours (25 credit hours in didactic formal graduate courses, a minimum of four elective credit hours and a minimum of 12 directed research hours). Additional hours may be completed for successful outcome of the M.S. degree. A cumulative GPA of 3.0 (with no more than six credit hours of a C grade) is required to continue in the program.

An oral defense, consisting of a public presentation of the thesis and a committee meeting to discuss the results, under the direction of the GAC but open to all faculty members, students and staff, shall be scheduled to examine the student's underlying fundamental knowledge of the disciplines encompassed by the student's research. Announcement of the oral defense, including the candidate's name, project title, and the day, place and time of the defense, shall be made at least seven working days in advance of the defense.

Curriculum requirements

Core didactic courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
IBMS 600	Laboratory Safety	1
MICR 505	Immunobiology	3
or MICR 515	Principles of Molecular Microbiology	
MICR 608	Introduction to Microbiology and Immunology Research	3
MICR 609	Introduction to Microbiology and Immunology Research	3
MICR 690	Microbiology Research Seminar	1
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		22

Electives

Course	Title	Hours
Select seven credits from the following:		7
MICR 505	Immunobiology (if not taken previously)	
MICR 515	Principles of Molecular Microbiology (if not taken previously)	
MICR 605	Prokaryotic Molecular Genetics	
MICR 607	Techniques in Molecular Biology and Genetics	
MICR 608	Introduction to Microbiology and Immunology Research	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis [1]	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis [1]	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
MICR 684	Molecular Biology of Cancer	
MICR 686	Advanced Immunobiology	
Take one of the following journal club courses for one semester every year:		variable
MICR 692	Current Topics in Molecular Pathogenesis	
MICR 693	Topics in Molecular Biology and Genetics	
MICR 694	Current Topics in Immunology	
Total Hours		7

1

MICR 616 and MICR 618 are offered in alternate years.

Directed research

Course	Title	Hours
MICR 697	Directed Research in Microbiology (minimum 12 credits)	12

Total graduate credit hours required (minimum) 41

Graduate program director
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(804) 828-2306

Additional contact
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Program website: vcu.edu/micro (http://www.vcu.edu/micro)

Microbiology and Immunology, Master of Science (M.S.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The master's curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology or provide the foundation for further graduate study toward a Ph.D.

It is expected that the program should be completed in approximately two to two-and-one-half years.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

A master's student in the MBG curriculum must prepare a formal written research plan and make an oral presentation of their thesis research proposal and progress report to their graduate advisory committee prior to the beginning of the second year of residency. The student's knowledge in the area of the proposed research, current research accomplishments and the feasibility of the proposed research project will be evaluated by the GAC. Successful completion of this review is required for continuance in the program and constitutes admission to candidacy.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Deadline date rolling, preference given to applications received by Jan 17	GRE; TOEFL for applicants whose native language is not English

Special requirements

- Applications for the program should be submitted to Molecular Biology and Genetics – M.S. selected from the drop-down menu of programs of the VCU online graduate application form. The degree awarded will be a Master of Science in Microbiology and Immunology.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned or expect to earn a baccalaureate or equivalent degree, and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics. Laboratory experience is also strongly recommended. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals. International applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the interdisciplinary master's curriculum in molecular biology and genetics requires a minimum of 48 credit hours, at least half of which must be course work restricted to graduate students. The curriculum includes 19 credit hours of required core course work and 29 additional credit hours of required course work, directed research and research seminar course work, and additional approved course work, as listed below. M.S. candidates must pass a final oral examination. A written thesis approved by the student's graduate advisory committee completes the requirements leading to the M.S. degree.

Curriculum requirements

Course	Title	Hours
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function [1]	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism [1]	1

BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology [1]	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics [1]	1
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (sections 004 and 005; two credits taken twice) [2]	4
MICR 607	Techniques in Molecular Biology and Genetics	2
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club, must take at least once)	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		19

[1] This requirement may also be satisfied with BIOC 503 (five credit hours).

[2] This requirement may also be satisfied, under certain circumstances, with MICR 608 or MICR 609 (three credit hours; section 002). Consult with the program director.

Other required course work (29 credits)

Course	Title	Hours
Select a minimum of one credit hour of directed research every semester of enrollment in the program after the first year of study from:		variable
MICR 697	Directed Research in Microbiology	
Select a minimum of one credit hour of research seminar course work every fall and spring semester of enrollment in the program from:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG)	
Select any appropriate graduate-level course offered by the School of Medicine or with the course designations of BIOL, BNFO, CHEB, CHEM, CLSE, EGRB, EPID, MEDC		3

Students make take additional course work with the approval of their graduate program directors.

Total graduate credit hours required (minimum) 48

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Neuroscience, Doctor of Philosophy (Ph.D.)

Program mission

The program offers an interdepartmental, integrated curriculum for graduate study leading to the Ph.D. in Neuroscience. The program prepares students to teach in the neuroscience disciplines at a university or academic health center and is distinguished by its objective to prepare students to function as independent research investigators.

Program goals

Upon completion of the Ph.D. in Neuroscience degree program, students will have:

1. Demonstrated a mastery of neuroscience and related bioscience knowledge
2. Developed effective oral, written and electronic communication skills
3. Demonstrated the ability to formulate, design, implement and interpret experimental approaches
4. Reached a level of competency to advance to positions as neuroscience researchers and teachers in a broad spectrum of academic, industrial and government employment venues
5. Successfully obtained employment in a neuroscience-related position

Student learning outcomes

1. Acquire the core knowledge of neuroscience: Students will demonstrate acquisition of core knowledge presented in required and elective courses.
2. Demonstrate knowledge of the neuroscience scientific literature: Students will demonstrate the ability to integrate and comprehensively review the scientific literature.
3. Acquire competency in oral communication: Students will prepare and deliver effective seminars and poster presentations.
4. Acquire competency in written communication: Students will generate an original dissertation and written comprehensive exam, as well as prepare and publish high quality scientific manuscripts.
5. Demonstrate the ability to design experiments: Students will evaluate existing scientific knowledge related to their project, identify a scientific question and formulate testable hypotheses.
6. Demonstrate the ability to conduct and interpret experiments: Students design experiments to test their hypotheses, carry out those experiments and interpret their results.
7. Obtain employment upon graduation: Student will successfully obtain employment in a neuroscience-related position upon graduation.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all

graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT TOEFL if international

Special requirements

- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. Baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. GRE > 153 quantitative, 156 verbal (or combined 1,250 on previous scale) and 4.0 analytical scores
3. TOEFL score of 600 (pBT), 250 (cBT) or 100 (iBT; or 6.5 on the IELTS for individuals for whom English is a second language
4. Personal statements, including:
   a. Long-term career goals to assess reasons behind application
   b. How a Ph.D. in biomedical science helps achieve those goals
   c. Initial motivating factors for a career in research
   d. Research experience, including dates, places and duration
5. Equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology or biophysics)

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the Ph.D. program must complete a minimum of 69 graduate credit hours.

Students must maintain a minimum cumulative GPA of 3.0 and must receive a minimum grade of B for all required courses. A student who receives a grade of C in a required course shall repeat the course. A second grade of C in a required course shall result in dismissal from the program.

At the end of the second year of required and elective course work, students will take written and oral comprehensive examinations. The written examination is an open-book written exam which is designed to: (1) assess the student's ability to integrate course material and (2) demonstrate critical thinking and evaluation of the literature in the basic health sciences related to the student's area of research. This part is based on a question provided to the student by their adviser and graduate advisory committee. The answer should be 25 to 35 pages in length and must represent the student's unaided work. This section of the exam is graded as pass/fail and must be completed by June 30 of the second year.

After passing the written comprehensive examination, students will schedule the proposal defense within six months. For the proposal

defense, students will prepare an NIH-style grant proposal based on their research plans. The proposal will form the basis of the oral candidacy exam. Students are strongly encouraged to submit their proposals for extramural funding (e.g., NIH predoctoral fellowships) where appropriate.

After successful completion of both parts of the written candidacy exam, the student's graduate advisory committee will administer the oral candidacy examination, which entails an oral defense of the student's grant proposal as well as the topics covered in part one of the written candidacy exam. The oral candidacy exam covers: (1) course work related to the student's proposed research; (2) the literature cited in or related to the proposal; and (3) the hypotheses, research techniques and procedures presented in the proposal.

Successful completion of the oral candidacy exam advances the student to candidacy for the doctoral degree. The oral candidacy exam must be completed prior to the beginning of the third year.
Beginning with the spring semester the third year in the graduate program, students will devote their full time to conducting research in their advisers' laboratories. Students also register for neuroscience research seminar and journal club each semester.

At the appropriate time in their research, students will prepare a dissertation and schedule a final oral defense of the thesis. The final oral examination (defense of the dissertation) will be limited to the subject of the candidate's dissertation and related basic science.

It is anticipated that students will complete the program in four to five years. All requirements for the Ph.D. degree must be completed within eight years from the date of matriculation in the degree program. Extensions may be approved in extenuating circumstances.

Curriculum requirements

Course	Title	Hours
ANAT 610	Systems Neuroscience	4
ANAT 615	Techniques in Neuroscience and Cell Biology	3
ANAT 620	Scientific Writing and Grantsmanship	2
Repeat the following one-credit course:		8
ANAT 630	Research Presentations	
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 691	Special Topics in Biochemistry (critical thinking)	1
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
Repeat the following two-credit course:		6
IBMS 620	Laboratory/Clinical Rotations	
IBMS 680	Proposal Preparation	1
NEUS 609	Cellular and Molecular Neuroscience	4
Repeat the following one-credit course:		8
NEUS 690	Neuroscience Research Seminar	
Repeat the following course:		variable
NEUS 697	Directed Research	
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Select two elective courses from the list below		6-8
Take credits in the following course to reach the required minimum of 69 credits		
NEUS 697	Directed Research	

Total graduate credit hours required (minimum) 69

Electives

Course	Title	Hours
Select two of the following (others may be approved by the graduate program director):		6-8
ANAT 608	Functional and Clinical Neuroanatomy	
ANAT 617	Developmental Neurobiology	
BIOC 605	Molecular Biology	
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
IBMS 635	Cellular Signalling	
NEUS 619	Synaptic Organization of the Brain	
PHIS 604	Cell Physiology: Cardiovascular and Respiratory	
PHIS 606	Molecular Basis for Disease	
PHIS 619	Mitochondrial Pathophysiology and Human Diseases	
PHIS/PHTX 620	Ion Channels in Membranes	
PHIS 631	Electrophysiology and Photonic Methods	
PHTX 536	Principles of Pharmacology and Toxicology	
PHTX 537	Principles of Pharmacology and Toxicology	
PHTX 548	Drug Dependence	
PHTX 632	Neurochemical Pharmacology	
Total Hours		6-8

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Program website: neuroscience.vcu.edu (http://www.neuroscience.vcu.edu)

Pharmacology and Toxicology, Doctor of Philosophy (Ph.D.)

Program goal

The Ph.D. program is designed to provide students with the skills required to advance to positions as bioscience researchers and trainers in a broad spectrum of positions. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches that address the questions identified. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Oral communication skills: The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. Written communication skills: The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
3. Experimental design: The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.
4. Problem-solving skills: The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
5. General knowledge of science: The candidate should demonstrate a general knowledge of the elements of the sciences as related to molecular/cellular bioscience and a detailed knowledge of his or her area of research, including an appropriate familiarity with the research literature.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Students wishing to matriculate into the Department of Pharmacology and Toxicology can contact the program director for further advice on course requirements and advising.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE TOEFL (individuals for whom English is a second language)

Special requirements

- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

Degree requirements

The broad base offered in the PhD. program in pharmacology and toxicology, together with basic training in physiology and biochemistry, provides the background for a successful career in academic institutions, industry or government. The research program of the department is sufficiently broad to provide an adequate basis for entry into a wide variety of interesting areas of modern biology and medicine.

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 60 graduate credit hours. With few exceptions, Ph.D. students are enrolled in the Biomedical Sciences Doctoral Portal from matriculation until matched with an adviser, usually by the summer semester of the second year. The students are moved into the Ph.D. in Pharmacology and Toxicology major after meeting program requirements. Students customarily complete formal course work in pharmacology and biochemistry during the first year of study. Participation in research also is begun early in the first year. Students interested or committed to pharmacology should take the footnoted ([1]) courses listed in the curriculum requirements section during the portal period to assure rapid progress toward the degree.

In the third and subsequent years, the majority of the course load is taken as PHTX 697. Advanced electives also may be taken as desired and with the approval of the adviser. Students and faculty participate in a seminar program (PHTX 690) that includes distinguished visiting scientists from the U.S. and abroad. Following completion of a qualifying examination, a degree candidate is required to submit and defend a thesis embracing an original research project conducted under the guidance and supervision of an adviser and an advisory committee. There is no foreign language requirement. The average time necessary to complete the doctoral program in pharmacology and toxicology is four to five years.

Curriculum requirements

Required courses

Course	Title	Hours
HGEN 692	Special Topics (classical and near class paper; 1 credit minimum) [1]	1
or IBMS 630	Critical Thinking	
IBMS 600	Laboratory Safety [1]	1
IBMS 620	Laboratory/Clinical Rotations (two-credit course taken for three rotations) [1]	6
PHTX 630	Basic Concepts in Pharmacology for Graduate Students	3
PHTX 636	Principles of Pharmacology	5
PHTX 639	Principles of Pharmacology Journal Club	1
PHTX 690	Pharmacology Research Seminar [1]	1
or IBMS 690	Basic Health Sciences Research Seminar	
Total Hours		18

[1]

Students interested in or committed to pharmacology should take these courses during the portal year to assure rapid progress toward the degree.

Recommended electives and directed research

Course	Title	Hours
Select a combination of the following courses as indicated below for a total of 42 credit hours to reach the required minimum of 60 credit hours:		42
Directed research		
PHTX 697	Directed Research in Pharmacology	
Elective courses		
ANAT 610	Systems Neuroscience	
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOC 601	Membranes and Lipids	
BIOC 602	Physical Properties of Macromolecules	
BIOC 605	Molecular Biology	
BIOS 543	Graduate Research Methods I	
CHEM 504	Advanced Organic Chemistry I	
EGRB 603	Biomedical Signal Processing	
EGRB 610	Microprocessor Interfacing for Biomedical Instrumentation	
IBMS 635	Cellular Signalling	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 601	Advanced Medicinal Chemistry I	
MEDC 630	Theoretical Methods in Drug Design	
MICR 505	Immunobiology	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
NEUS 609	Cellular and Molecular Neuroscience	
PHIS 501	Mammalian Physiology	

PHIS 604	Cell Physiology: Cardiovascular and Respiratory
PHIS 615	Signal Detection in Sensory Systems
PHTX 632	Neurochemical Pharmacology
PHTX 633	Behavioral Pharmacology
PHTX/FRSC 644	Forensic Toxicology
PHTX 697	Directed Research in Pharmacology (variable credits)
Total Hours	42

Total graduate credit hours required (minimum) 60

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contact
Sheryol W. Cox
Coordinator, graduate programs in pharmacology and toxicology
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(804) 828-8400

Program website: pharmtox.vcu.edu (https://pharmtox.vcu.edu)

Pharmacology and Toxicology, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The doctoral curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The program centers on a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a doctoral dissertation.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Applications received prior to Jan 15 given priority consideration	GRE, MCAT or DAT

Special requirements

- MCAT or DAT acceptable in lieu of GRE for combined professional/academic degree programs
- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)
7. Laboratory experience also strongly recommended

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 60 graduate credit hours.

During the first year, students pursue research rotations, take formal course work and become familiar with current research topics through seminars, discussion groups and lectures by distinguished scientists. By the end of the first year, students choose a faculty adviser and begin dissertation research. Prior to the beginning of the third year of study, students should successfully pass written and oral candidacy examinations. Following completion of the research project and defense of the doctoral dissertation, graduates are equipped to participate in a broad range of current biomedical research areas.

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology [1]	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 602	Physical Properties of Macromolecules (modules 1 and 2)	2
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
IBMS 620	Laboratory/Clinical Rotations (three rotations)	6
Select one of the following (or an equivalent):		1
IBMS 630	Critical Thinking	
BIOC 691	Special Topics in Biochemistry	
HGEN 691	Special Topics in Genetics	
IBMS 680	Proposal Preparation	1
IBMS 690	Basic Health Sciences Research Seminar	1
MICR 605	Prokaryotic Molecular Genetics	3
MICR 607	Techniques in Molecular Biology and Genetics	2
Take one credit of the following every semester beginning in the second year:		variable
MICR 690	Microbiology Research Seminar (section 002 – MBG)	
Take the following course at least twice:		variable
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club)	
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	

[1]

Students may complete the five-credit module sequence BIOC 530, BIOC 531, BIOC 532 and BIOC 533 in place of BIOC 503.

Eukaryotic molecular biology course

Course	Title	Hours
Select one of the following courses in eukaryotic molecular biology from the following list of approved options (or an approved alternative):		3
BIOC 605	Molecular Biology	
HGEN 602	Genetic Models of Disease	
HGEN 614	Pathogenesis of Human Genetic Disease	
IBMS 635	Cellular Signalling	
MICR 684	Molecular Biology of Cancer	
PATH 670	Experimental Approaches to Tumor Biology	
Total Hours		3

Directed research and elective courses

Course	Title	Hours
Select a variable number of credit hours of the following to amass the required minimum of 60 credit hours.		variable
PHTX 697	Directed Research in Pharmacology	
Elective courses		

Total graduate credit hours required (minimum) 60

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
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(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Pharmacology and Toxicology, Master of Science (M.S.)

Program goal

The graduate program leading to the Master of Science in Pharmacology and Toxicology prepares individuals for a variety of career objectives in biomedical science. These careers include but are not limited to as industrial scientists and scientists in government regulatory agencies. The M.S. program will be of interest to individuals planning on pursuing technical positions in pharmacology or toxicology research or testing; students interested in the health professions, such as medicine or dentistry, who desire additional research training; and those interested in government positions, such as those in regulatory agencies, that require training in pharmacology and toxicology.

The program incorporates formal instructional activity and research training mentored by members of the graduate faculty. The master's program is distinguished from the Ph.D. degree offered by the department in that the M.S. student is not being prepared for a career as an independent investigator.

Student learning outcomes

1. Communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric. The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
2. Integrated knowledge of bioscience: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization

and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.

3. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Apr 15	GRE (MCAT acceptable in lieu of GRE)

Special requirements

- See the departmental website for additional information on the application process.

In addition to the general admission requirements of the VCU Graduate School (p. 34), qualified applicants to the M.S. degree program typically must have:

1. Baccalaureate degrees with a major in fields such as biology, chemistry, biochemistry, pharmacy and related sciences
2. GRE scores of 1100 (verbal plus quantitative) and 3.5 (analytical) or equivalent scores on the new GRE exam
3. Undergraduate GPA of 3.2
4. Some laboratory research experience

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students in the master's program must complete a minimum of 30 graduate credit hours.

The Master of Science in Pharmacology and Toxicology is a research-oriented degree program comprising graduate course work and supervised research leading to a master's thesis. Students must conduct a substantial original investigation under the supervision of their advisers and must prepare and defend a thesis reporting the results of this research. It is highly recommended that students identify mentors for dissertation research as soon as possible within the first semester to ensure timely progress in their research.

When the thesis has been completed, copies are submitted to the members of the student's graduate advisory committee. The student's GAC decides upon the acceptability of the candidate's thesis. If the committee unanimously accepts the thesis for defense, the candidate appears before them for a final oral examination.

M.S. students are required to present a departmental seminar prior to the final oral thesis defense as a requirement for completion of the thesis.

Curriculum requirements

Required courses

Substitutions may be approved by the graduate program director.

Course	Title	Hours
IBMS 600	Laboratory Safety	1
PHTX 630	Basic Concepts in Pharmacology for Graduate Students	3
PHTX 636	Principles of Pharmacology	5
PHTX 639	Principles of Pharmacology Journal Club	1
PHTX 690	Pharmacology Research Seminar [1]	1
Total Hours		11

[1]

M.S. students are required to present a departmental seminar prior to the final oral thesis defense as a requirement for completion of the thesis.

Advanced elective

Course	Title	Hours
Select one advanced elective course in their specialty areas in addition to completing the research-based dissertation (See list below)		3

Directed research

Course	Title	Hours
PHTX 697	Directed Research in Pharmacology (variable credit course taken for a minimum of 16 credits)	16
Total Hours		16

Total graduate credit hours required (minimum) 30

Recommended advanced electives

Course	Title	Hours
ANAT 610	Systems Neuroscience	4
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	1
BIOC 601	Membranes and Lipids	3
BIOC 602	Physical Properties of Macromolecules	1-4
BIOC 605	Molecular Biology	2
CHEM 504	Advanced Organic Chemistry I	3
EGRB 603	Biomedical Signal Processing	3
EGRB 610	Microprocessor Interfacing for Biomedical Instrumentation	3
IBMS 635	Cellular Signalling	3
MEDC 541	Survey of Molecular Modeling Methods	1
MEDC 601	Advanced Medicinal Chemistry I	2
MEDC 630	Theoretical Methods in Drug Design	2
MICR 505	Immunobiology	3
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	3
NEUS 609	Cellular and Molecular Neuroscience	4
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
PHIS 604	Cell Physiology: Cardiovascular and Respiratory	3
PHIS 615	Signal Detection in Sensory Systems	3
PHTX/PHIS 620	Ion Channels in Membranes	3
PHTX 632	Neurochemical Pharmacology	3
PHTX 633	Behavioral Pharmacology	3
PHTX 644	Forensic Toxicology	3

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study, or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contact
Sheryol W. Cox
Coordinator, graduate programs in pharmacology and toxicology
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(804) 828-8400

Program website: pharmtox.vcu.edu (https://pharmtox.vcu.edu)

Pharmacology and Toxicology, Master of Science (M.S.) with a concentration in molecular biology and genetics

Program goals

The molecular biology and genetics curriculum is an integrated interdisciplinary program of study that builds on the graduate programs of participating departments in the School of Medicine. The master's curriculum is designed to be an intensive course of study that will provide students with the skills required to advance to research-oriented careers in biotechnology or provide the foundation for further graduate study toward a Ph.D.

It is expected that the program should be completed in approximately two to two-and-one-half years.

1. The curriculum includes core, specialization and elective courses. Electives drawn from various departments allow individual specialization.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation. The program relates this framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
3. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.
4. The final three semesters include a research project conducted under the guidance of a selected faculty mentor and culminates in the presentation and defense of a master's thesis.

Participating faculty are associated not only with programs and departments within the School of Medicine, but also with the VCU Massey Cancer Center, the Philips Institute for Oral and Craniofacial Molecular Biology (School of Dentistry), the Institute of Structural Biology and Drug Discovery (School of Pharmacy) and the VCU Center for the Study of Biological Complexity (VCU Life Sciences).

The interdisciplinary approach to the solution of biological problems provided by this training is designed to develop in students the flexibility and problem-solving skills necessary for success in a variety of scientific career opportunities or further graduate study.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree

candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

A master's student in the MBG curriculum must prepare a formal written research plan and make an oral presentation of their thesis research proposal and progress report to their graduate advisory committee prior to the beginning of the second year of residency. The student's knowledge in the area of the proposed research, current research accomplishments and the feasibility of the proposed research project will be evaluated by the GAC. Successful completion of this review is required for continuance in the program and constitutes admission to candidacy.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Deadline date rolling, preference given to applications received by Jan 17	GRE; TOEFL for applicants whose native language is not English

Special requirements

- Applications for the program should be submitted to Molecular Biology and Genetics – M.S. selected from the drop-down menu of programs of the VCU online graduate application form. The degree awarded will be a Master of Science in Pharmacology and Toxicology.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have earned or expect to earn a baccalaureate or equivalent degree, and must have demonstrated a superior knowledge of biology, chemistry, physics and mathematics. Laboratory experience is also strongly recommended. The Graduate Record Examination is required, as are letters of recommendation and a letter summarizing the applicant's goals. International applicants who do not use English as their native language must take the Test of English as a Foreign Language examination.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), the interdisciplinary master's curriculum in molecular biology and genetics requires a minimum of 48 credit hours, at least half of which must be course work restricted to graduate students. The curriculum includes19 credit hours of required core course work and 29 additional credit hours of required course work, directed research and research seminar course work, and additional approved course work, as listed below. M.S. candidates must pass a final oral examination. A written thesis approved by the student's graduate advisory committee completes the requirements leading to the M.S. degree.

Curriculum requirements

Required courses

Course	Title	Hours
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function [1]	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism [1]	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology [1]	1
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics [1]	1
IBMS 600	Laboratory Safety	1
IBMS 620	Laboratory/Clinical Rotations (sections 004 and 005; two credits taken twice) [2]	4

MICR 607	Techniques in Molecular Biology and Genetics	2
MICR 693	Topics in Molecular Biology and Genetics (MBG journal club, must take at least once)	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
Total Hours		19

[1]

This requirement may also be satisfied with BIOC 503 (five credit hours).

[2]

This requirement may also be satisfied, under certain circumstances, with MICR 608 or MICR 609 (three credit hours; section 002). Consult with the program director.

Other required course work (29 credits)

Course	Title	Hours
Select a minimum of one credit hour of directed research every semester of enrollment in the program after the first year of study from:		variable
MICR 697	Directed Research in Microbiology	
or PHTX 697	Directed Research in Pharmacology	
Select a minimum of one credit hour of research seminar course work every fall and spring semester of enrollment in the program from:		variable
MICR 690	Microbiology Research Seminar (section 002, MBG)	
Select any appropriate graduate-level course offered by the School of Medicine or with the course designations of BIOL, BNFO, CHEB, CHEM, CLSE, EGRB, EPID, MEDC		3

Students make take additional course work with the approval of their graduate program directors.

Total graduate credit hours required (minimum) 48

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Gail E. Christie, Ph.D.
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(804) 828-9093

Program website: vcu.edu/mbg (http://www.vcu.edu/mbg)

Pharmacy, Doctor of (Pharm.D.)/Public Health, Master of (M.P.H.) [combined]

To qualify as a dual-degree student in any of the training paradigms which appear in the Bulletin, a student must have evidence of having been simultaneously enrolled in one or more courses of both of the programs constituting the “dual degree” for at least one semester.

The School of Pharmacy and the Division of Epidemiology in the Department of Family Medicine and Population Health in VCU’s School of Medicine offer a dual-degree program through which students earn both Pharm.D. and M.P.H. degrees. This dual-degree program offers students the opportunity to achieve a Doctor of Pharmacy while also learning about research and the importance of population health. This five-year program requires students to spend the fourth year of the Pharm.D. program pursuing the M.P.H. degree, after which they transition back to pharmacy for advanced practice experiences.

Students are required to take a minimum of 36 credits in the M.P.H. curriculum. This includes 27 credit hours of core and required courses, a minimum of six credit hours of elective courses and a minimum of three credit hours of a capstone project that examines a relevant public health topic. Note that some elective courses may not be available in certain years or may require instructor permission for registration. The M.P.H. internship requirement will be satisfied by Pharm.D. special advanced practice experiences in community health during the fifth year of the program.

The required M.P.H. capstone project will be completed in a community setting during the P5 year; it will involve a comprehensive project that serves the needs of a professional public health organization and typically involves the development of one or more deliverables. Examples include a disease surveillance project, a needs assessment or program evaluation, or analysis of survey data.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master’s or doctoral status according to the degree candidacy

requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

For M.P.H., apply online at sophas.org (http://www.sophas.org) and complete a VCU supplemental application following instructions available at sophas.org**. Pharm.D. applicants follow instructions on the School of Pharmacy website** (http://pharmacy.vcu.edu/programs/pharmd/prospective/apply)**.**

Please review the admission requirements for each stand-alone degree (Master of Public Health and Doctor of Pharmacy) in the VCU Graduate and Professional Bulletins to learn the specific application requirements for each program.

Curriculum requirements

M.P.H. courses

Course	Title	Hours
Program core		
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 548	Applied Data Analysis Lab II	1.5
EPID 571	Principles of Epidemiology	3
EPID 580	Public Health Ethics	1
EPID 593	Foundations of the Public Health Profession	2
EPID 594	MPH Practicum	2
EPID 604	Principles of Environmental Health	3
EPID 694	MPH Capstone Project	3
HCPR 601	Introduction to Health Policy	3
OVPR 603	Responsible Conduct of Research	1
SBHD 605	Introduction to Social and Behavioral Health	3
Additional program courses		
Electives		
Select a minimum of six credit hours of elective course work selected according to an area(s) of interest in public health. These may include the following:		6
BIOS 549	Spatial Data Analysis	
BIOS 571	Clinical Trials	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
EPID 600	Introduction to Public Health	
EPID 601	Contemporary Issues and Controversies in Public Health	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
EPID 622	Maternal and Child Health	
EPID 624	Chronic Disease Epidemiology	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 692	Independent Study	
GRAD 614	Introduction to Grant Writing	
GRTY 501	Physiological Aging	
GRTY 510	Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
HEMS 505	Contemporary Issues in Health	
HEMS 604	Nutrition for Health and Physical Activity	
HEMS 550	Exercise, Nutrition and Weight Management	
HEMS 605	Psychology of Physical Activity	
HEMS 606	Psychosocial Aspects of Sport and Physical Activity	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
PSYC 660	Health Psychology	
SBHD 608	Health Communication	
SBHD 609	Research Methods in Social and Behavioral Health I	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
SBHD 632	Health Disparities and Social Justice	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	

SBHD 638	Applications in Qualitative Research Methods	
SOCY 510	Domestic and Sexual Violence in Social Context	
SOCY 524	Aging and the Minority Community	
SOCY 603	Seminar in Population Studies	
SOCY 607	Seminar in Racial and Ethnic Relations in America	
SOCY 611	Studies in the Community	
SOCY 620	Seminar in Criminology	
SOCY 624	Community and Community Services for the Elderly	
SOCY 632	Intimate Partner and Sexual Violence: Medical Practice and Policy	
SOCY 633	Application of the Policy Process to Issues of Violence	
SOCY 634	Social Contexts of Childhood and Violence	
SOCY 635	Theorizing Gender Violence	
SOCY 645	The Sociology of Health and Illness	
URSP 521	Introduction to Geographic Information Systems	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 625	Spatial Database Management and GIS Modeling	
Noncurricular requirements		
In addition to course work, students must attend 12 public health seminars and complete 20 hours of community-based service-learning.		
Total Hours		36

Pharm.D. courses

Course	Title	Hours
IPEC 501	Foundations of Interprofessional Practice	1
IPEC 502	Interprofessional Quality Improvement and Patient Safety	1
IPEC 561	IPE Virtual Geriatric Case	2
MEDC 527	Basic Pharmaceutical Principles for the Practicing Pharmacist	3
MEDC 533	Pharmacognosy	2
MEDC 542	Biotechnology-derived Therapeutic Agents	1
MEDC 543	Clinical Chemistry for the Pharmacist	1
MEDC 553	Clinical Therapeutics Module: Introduction to Medicinal Chemistry	1
PCEU 501	Pharmaceutical Calculations	1
PCEU 507	Pharmaceutics and Biopharmaceutics I	3
PCEU 508	Pharmacokinetics	3
PCEU 509	Pharmaceutics and Biopharmaceutics II	3
PCEU 615	Applied Pharmacokinetics	2.5
PHAR 509	Evidence-Based Pharmacy I: Introduction to Pharmacy Information Skills	1.5
PHAR 513	Contemporary Pharmacy Practice	2
PHAR 515	Continuous Professional Development I	1
PHAR 523	Foundations I	1.5
PHAR 524	Foundations II	1.5
PHAR 526	Community Pharmacy Practice	2
PHAR 529	Clinical Therapeutics Module: Introduction to Special Populations	2
PHAR 530	Introductory Pharmacy Practice Experience: Community Practice	4
PHAR 532	Introductory Pharmacy Practice Experience: Hospital Practice	3
PHAR 533	Introductory Pharmacy Practice Experience: Patient Care	0.5
PHAR 534	Foundations III	1.5
PHAR 535	Foundations IV	1.5
PHAR 540	Self-Care and Alternative and Complementary Treatments	2.5
PHAR 541	Patient Assessment in Pharmacy Practice	2
PHAR 544	Clinical Therapeutics Module: Cardiovascular	4.5
PHAR 545	The U.S. Health Care System	2
PHAR 549	Personalized Medicine	1
PHAR 555	Clinical Therapeutics Module: Endocrinology	2.5
PHAR 556	Clinical Therapeutics Module: Neurology	4
PHAR 565	Evidence-based Pharmacy II: Research Methods and Statistics	2.5
PHAR 566	Evidence-based Pharmacy III: Drug Literature Evaluation	2
PHAR 602	Clinical Therapeutics Module: Psychiatry	3
PHAR 603	Clinical Therapeutics Module: Respiratory/Immunology	3
PHAR 604	Clinical Therapeutics Module: Infectious Diseases	4.5
PHAR 605	Clinical Therapeutics Module: Hematology/Oncology	2.5
PHAR 606	Clinical Therapeutics Module: Nephrology/Urology	2
PHAR 607	Clinical Therapeutics Module: Dermatology/EENT and Joint	2
PHAR 615	Continuous Professional Development II	1
PHAR 618	Clinical Therapeutics Module: Gastrointestinal/Nutrition	2.5
PHAR 619	Clinical Therapeutics Module: Women's Health/Bone	2
PHAR 620	Clinical Therapeutics Module: Critical Care/Toxicology and Complex Patients	2.5
PHAR 621	Pharmacoeconomics	2
PHAR 622	Epidemiology and Pharmacy Practice	2

PHAR 640	Foundations V	1.5
PHAR 645	Foundations VI	1.5
PHAR 652	Health Promotion and Communication in Pharmacy Practice	2.5
PHAR 660	Community Pharmacy Practice Management II	2
PHAR 715	Continuous Professional Development III	1
PHAR 724	Pharmacy Law	2.5
PHAR 730	Continuous Professional Development IV	.5
PHAR 760	Acute Care Pharmacy Practice I	5
PHAR 761	Advanced Hospital Pharmacy Practice	5
PHAR 762	Geriatrics Pharmacy Practice	5
PHAR 763	Ambulatory Care Pharmacy Practice	5
PHAR 765	Elective I	5
PHAR 766	Elective II	5
PHAR 768	Advanced Community Pharmacy Practice	5
PHAR 773	Acute Care Pharmacy Practice II	5
PHTX 606	Introduction to Pharmacology of Therapeutic Agents (Pharmacy)	1
Electives		5
Total Hours		156

Total graduate credit hours required (minimum) 192

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program directors
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Additional contact
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Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu) and **familymedicine.vcu.edu/epidemiology/mph/dual-degrees**

Physiology and Biophysics, Doctor of Philosophy (Ph.D.)

Program goals

1. The program is designed to provide students with the skills required to advance to positions as bioscience researchers and trainers in a broad spectrum of positions.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience.
3. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
4. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired.
   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
   b. Written communication skills: Degree candidates will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Department handbook

Applicants and students may request a handbook with additional information, which is also summarized on the departmental website (physiology.vcu.edu/education/phd (http://www.physiology.vcu.edu/education/phd)). Please feel free to contact the graduate program coordinator with any questions.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 17	GRE, MCAT or DAT

Special requirements

- Applications for the program must be submitted to the Biomedical Sciences Doctoral Portal – School of Medicine – Ph.D. selected from the drop-down menu of programs on the VCU online application form.

In addition to the general admission requirements of the VCU Graduate School (p. 34), successful applicants will typically have the following credentials:

1. A baccalaureate degree or its equivalent at the time of enrollment, with an undergraduate GPA of 3.5
2. Current GRE scores (taken within the past five years), with scores at the 75th percentile or greater preferred
3. TOEFL scores of 600 (pBT), 250 (cBT) or 100 (iBT) for individuals for whom English is a second language; or 6.5 on the IELTS (To report GRE or TOEFL score, use VCU Code 5570.)
4. Personal statements, which should include: long-term career goals to assess reasons behind the candidate's application; how a Ph.D. in biomedical science helps achieve those goals; the factors motivating a career in research; research experience, including dates, places and duration
5. Three letters of recommendation that speak to the scientific competency and experience of the applicant
6. The equivalent of two semesters of general chemistry, two semesters of organic chemistry and two semesters of upper-level biology courses (e.g. cell biology, molecular biology, biochemistry, genetics, neuroscience, physiology, biophysics, etc.)

Degree requirements

Graduate study in the Department of Physiology and Biophysics in the School of Medicine is a highly individualized undertaking, of which required course work is only one component. Each student's program is tailored to meet his or her particular interests, with the primary emphasis on developing research skills and the capacity for scholarship.

Opportunities for research experience begin in the first year, when students spend time working in several faculty laboratories of their choice. These lab rotations enable students to examine current faculty research projects and choose their areas of specialization. In the second and subsequent years, increasingly more time is devoted to independent research under the guidance of a faculty adviser. Department-sponsored seminars give students opportunities to discuss their research interests with visiting scientists and many students present their work at national professional meetings.

The Ph.D. program in physiology and biophysics normally takes at least four years to complete. The first two years are devoted mainly to course work. The first year consists primarily of required courses, while the second is geared toward electives and research. On satisfactory completion of two years of course work, students must pass written and oral comprehensive examinations to qualify for degree candidacy. Following admission to candidacy, each student must conduct a substantial original research project, prepare a written dissertation and defend it successfully in an oral examination.

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 66 credit hours for the Ph.D., including directed research.

Curriculum requirements

Required courses (variable credits)

Course	Title	Hours
BIOC 503	Biochemistry, Cell and Molecular Biology [1]	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
BIOC 691	Special Topics in Biochemistry (section-004 critical thinking) [2]	1
IBMS 600	Laboratory Safety	1
IBMS 610	Laboratory Opportunities	0.5
Repeat the following two-credit course:		6
IBMS 620	Laboratory/Clinical Rotations	
IBMS 680	Proposal Preparation	1
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct	
OVPR 603	Responsible Conduct of Research	
PHIS 501	Mammalian Physiology	5
PHIS 604	Cell Physiology: Cardiovascular and Respiratory	3
PHIS 606	Molecular Basis for Disease	3
Take the following one-credit course each fall and spring semester:		variable
PHIS 690	Physiology Research Seminar	
PHIS 691	Special Topics in Physiology (section-004: writing workshop)	1
PHIS 691	Special Topics in Physiology (section-501: companion to PHIS 501)	1
PHIS 692	Special Topics (section-606: seminar for PHIS 606)	1
Take the following 0.5 credit- hour course each fall and spring semester:		variable
PHIS 695	Research in Progress	
Select six credits in elective courses from the following:		6
Selected 500- and 600-level courses in physiology (PHIS)		
Other basic science departments (ANAT, BIOC, BIOS, HGEN, IBMS, MICR and PHTX)		
Other courses as approved by the program		

1

Note: This is a modular course; the full course is five credit hours, but students may choose to take a subset of the modules for fewer hours.

2

Note: Another critical-thinking course may substitute for this requirement, e.g. HGEN 691 or IBMS 630.)

Directed research and additional courses (variable credits)

Course	Title	Hours
Select additional credits in the following to amass the required minimum of 66 credit hours:		variable
PHIS 697	Directed Research in Physiology	
Other elective courses approved by the program		

Total graduate credit hours required (minimum) 66

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contacts
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Graduate program assistant director
cescalante@vcu.edu
(804) 628-1202

Christina Kyrus
Graduate program coordinator
cikyrus@vcu.edu
(804) 628-5506

Program website: physiology.vcu.edu (http://physiology.vcu.edu)

Physiology and Biophysics, Master of Science (M.S.)

Program goal

The master's program in physiology and biophysics s designed to provide students with the skills required to advance to positions as physiology and bioscience researchers and trainers in a broad spectrum of positions. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of physiology and bioscience, as well as an ability to synthesize this information and apply this foundation to the identification of key areas of investigation and experimentation in bioscience. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified. In addition, students will develop skills in the various means of communicating both the core of bioscience knowledge and the

expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
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   a. Oral communication skills: Degree candidates will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
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Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall preferred	Apr 15	GRE, MCAT or DAT

Special requirements

- Students admitted through the Certificate in Pre-medical Graduate Health Sciences program only.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants generally meet the following minimum requirements: baccalaureate degree or its equivalent at the time of enrollment and successful completion of the Certificate in Pre-medical Graduate Health Sciences.

Basic science, research-intensive, non-thesis curriculum for medical students

Individuals who are participants in medical training (the Doctor of Medicine program) at VCU may be eligible for enrollment in a research-intensive, non-thesis graduate curriculum. This basic science option

builds on the core of disciplinary material embedded in the first two years of training in the medical school curriculum. Additional exposure is provided to specialized areas in basic science disciplines in concert with an intensive research experience leading to the preparation of a report in the form of a manuscript suitable for publication. The program is designed to be completed within 12 to 15 months. Subject matter related to the core material and/or suitable elective courses taken in the didactic phase of medical training correspond to a minimum of the equivalent of 24 graduate credit hours. The equivalent of 12 credit hours may be applied to the M.S. degree program in which the student is enrolled in accordance with Graduate School policy. Medical students interested in the basic science option should contact the M.S. graduate program director for additional information.

Degree requirements

The Department of Physiology and Biophysics offers courses of study leading to the Master of Science and the Doctor of Philosophy. A combined M.D./Ph.D. degree program is also available through this department and the School of Medicine. It is generally recommended that students intending to pursue careers as professional physiologists should attempt to earn the Ph.D. Work done in partial or complete fulfillment of the requirements for the master's degree may be applied toward the Ph.D. provided that it is of adequate quality.

Graduate education in physiology and biophysics is a highly individualized enterprise, of which the formal course requirements comprise only a portion. The degree program described here provides an opportunity for apprenticeship in research and, through this, the development of a capacity for scholarship. The essence of this type of education lies in the development of a close relationship between the student and the faculty adviser. The adviser and the student, jointly and with the approval of the department chair and the associate dean of medicine for graduate education, select the student's graduate advisory committee.

The M.S. degree program includes a year of didactic course work (completed as part of the Certificate in Pre-medical Graduate Health Sciences program) and a second year largely devoted to the completion of an independent research project, writing a thesis based on this work and a successful oral defense of this thesis and completed course work.

In addition to the general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 30 graduate credit hours for the M.S. in Physiology and Biophysics.

Teaching experience

M.S. students also have the opportunity to acquire teaching experience and financial support by serving as teaching assistants for PHIZ 206 Human Physiology Laboratory for one semester. Teaching assistants must complete PHIS 691 (PHIS 501) for two credit hours prior to or concurrent with the assistantship.

Curriculum requirements

Course	Title	Hours
Select one of the following:		1
OVPR 601	Scientific Integrity	
OVPR 602	Responsible Scientific Conduct (online)	
OVPR 603	Responsible Conduct of Research (hybrid)	
PHIS 604	Cell Physiology: Cardiovascular and Respiratory	3
PHIS 606	Molecular Basis for Disease (001)	3
Take two credits in the following course:		2
PHIS 690	Physiology Research Seminar (901)	
PHIS 692	Special Topics (606)	1
Take 20 credits in the following course:		20
PHIS 697	Directed Research in Physiology (801)	
Total Hours		30

Total graduate credit hours required (minimum) 30

Advanced optional elective courses available in the second year include:

Course	Title	Hours
PHIS 612	Cardiovascular Physiology	3
PHIS 615	Signal Detection in Sensory Systems	3
PHIS 619	Mitochondrial Pathophysiology and Human Diseases	3
PHIS/PHTX 620	Ion Channels in Membranes	3
PHIS 630	Methods in Molecular Biophysics: A Practical Approach	2
PHIS 631	Electrophysiology and Photonic Methods	2
PHIS 691	Special Topics in Physiology ((003))	3

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
Roland Pittman, Ph.D.
Professor, Department of Physiology and Biophysics
pittman@vcu.edu
(804) 828-9545

Additional contacts
Carlos Escalante, Ph.D.
Graduate program assistant director
cescalante@vcu.edu
(804) 628-1202

Christina Kyrus
Graduate program coordinator
cikyrus@vcu.edu
(804) 628-5506

Program website: physiology.vcu.edu (http://www.physiology.vcu.edu)

Pre-medical Graduate Health Sciences, Certificate in (Post-baccalaureate graduate certificate)

Program goal

The pre-medical graduate health sciences certificate program in the School of Medicine provides an advanced level of didactic training in the biomedical sciences to enhance the preparation of students for a variety of career options, particularly professional degree training (i.e. M.D./D.O., D.D.S., M.S. and Ph.D.). The program also provides the opportunity for the development of an informed approach to the admission process in professional and/or advanced degree training to enhance the prospect of advancement.

Student learning outcomes

1. Achievement of a threshold competency in the basic health sciences: The candidate will achieve/surpass expectations of a threshold-level competency in the basic health sciences, particularly in areas related to gaining admission to professional and/or higher-level degree programs.
2. MCAT/DAT preparation: The candidate will be prepared to take and/or retake standardized tests. The candidate will achieve a score that fulfills medical or dental school admission requirements.
3. Preparation for career advancement: The candidate who meets the threshold competency objective will display an enhanced level of advancement to higher levels of professional and/or advanced degree training.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

Applying to professional school and advanced graduate degree programs
Students must follow admission guidelines for applications to the M.D./D.O., M.S., D.D.S. and other programs. Completion of the certificate program does not afford a guaranteed admission to professional training programs at VCU. Exceptional performance, 3.5 GPA and a 28 MCAT guarantees an interview at VCU School of Medicine. Similar criteria increase eligibility for an interview at the VCU School of Dentistry.

Advising: Students are encouraged to seek opportunities for academic, personal and professional development from the Division for Academic Success, Career Services and the CERT Program Office. For students who choose to take a year off between CERT and professional school, several School of Medicine professors hire students for research positions and area hospitals offer SCRIBE programs that actively recruit VCU graduates. The CERT Program Office can also help identify possibilities.

Letters of reference: The CERT program adviser will provide a letter of reference for professional school applications. Students must schedule an appointment to interview with the program adviser for a letter.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	Jul 1	GRE, MCAT or DAT TOEFL for international students

Special requirements

- While there is no official deadline for applying to the certificate program, the school strongly recommends applicants have all of materials into the graduate admissions office by July 1 to ensure that the file can be processed in time for the fall semester. The program has rolling admissions for a limited number of positions.

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must complete a minimum of 27 graduate credit hours of course work with a minimum GPA of 3.0 (4.0 scale), with no more than 20 percent of the total credit hours at the C or below level. The curriculum is composed of six required courses (15 credit hours) and 12 credit hours of electives spread over two semesters. The curriculum should be completed in one academic year (fall and spring semester).

Required and elective courses are drawn from departments within the School of Medicine: the departments of Anatomy and Neurobiology, Biochemistry and Molecular Biology, Human and Molecular Genetics,

Microbiology and Immunology, Pharmacology and Toxicology, and Physiology and Biophysics. All courses are held on the MCV Campus. In addition to the elective courses shown other courses may be applied as electives with the approval of the course director.

Curriculum requirements

Required courses

Course	Title	Hours
PHIS 501	Mammalian Physiology	5
BIOC 503	Biochemistry, Cell and Molecular Biology	5
BIOC 504	Biochemistry, Cell and Molecular Biology	5
Total Hours		15

Electives

Course	Title	Hours
ANAT 611	Histology	5
ANAT 612	Human Embryology	2
BIOL 530/HGEN 501	Introduction to Human Genetics	3
BIOS 543	Graduate Research Methods I	3
HGEN 502	Advanced Human Genetics	3
IBMS 690	Basic Health Sciences Research Seminar (or department-specific 690 course) (Recommended for students planning to apply to the CERT/M.S. program)	1
MEDC 533	Pharmacognosy	2
MICR 505	Immunobiology	3
MICR 616	Mechanisms of Viral and Parasite Pathogenesis	3
NEUS 609	Cellular and Molecular Neuroscience	4
PHIS 512	Cardiac Function in Health and Disease	3
PHTX 548	Drug Dependence	3
PHTX 536	Principles of Pharmacology and Toxicology	5

Total graduate credit hours required (minimum) 27

Graduate program director
Vacant - Contact Certificate program office for information.

Additional contact
Judy Silberg, Ph.D.
Program adviser
jsilberg@vcu.edu

Certificate program office
premedcert@vcu.edu
(804) 828-9501

Program website: medschool.vcu.edu/graduate/premed_cert (http://www.medschool.vcu.edu/graduate/premed_cert)

Public Health, Master of (M.P.H.)

Program accreditation
Council on Education for Public Health

Program goal

The mission of the VCU M.P.H. program is to engage students in an experiential and learner-centered environment, collaborate with public health partners in Central Virginia to promote health equity and community wellness and foster lifelong inquiry and discovery in interdisciplinary, translational research that improves human health.

The overall goal of the M.P.H. program is to educate students to become well-grounded in the essential knowledge, skills and attitudes of public health and demonstrate their ability to apply these essentials through course work, internships and the M.P.H. capstone project. This program is designed to provide students with the skills required to advance to positions as public health practitioners in a broad spectrum of positions and settings and who can perform the following:

1. Administer public health programs
2. Collect, analyze and evaluate public health data
3. Plan, implement and evaluate public health interventions
4. Apply results of evaluations and data analyses to policy development as necessary
5. Promote public health through educational campaigns

The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of public health and an ability to synthesize and apply this information to the identification of key areas of practice and research in public health. Students will develop educational competencies outlined by the M.P.H. program. These competencies cover the foundational knowledge necessary for a public health practitioner to both communicate the core of public health knowledge and express the design, results and interpretation of various public health interventions, evaluations, and data collection and analysis efforts to a variety of potential audiences.

Student learning outcomes

Student learning outcomes are monitored by the program faculty and center primarily around competencies for all students. Overall learning outcomes are as follows.

1. Integrated knowledge of public health: Students will demonstrate knowledge of the current elements of public health, at a level assessed by program faculty as competent or higher, according to the program rubric.
2. Demonstration of focused knowledge and skills: Students will demonstrate more detailed knowledge and applied skills in the individual area of scholarship, including familiarity with the research literature and the ability to evaluate and critique publications, at a level assessed by program faculty as competent or higher, according to the program rubric.
3. Development of competencies: Through program course work and applied experiences, students will develop competence in the discipline of public health as demonstrated through annual self-assessment of performance on the M.P.H. program competencies and faculty assessment of (1) student competence in semi-annual student reviews and (2) student performance in the program's integrated learning experience, the capstone project.
4. Training in appropriate public health skills/knowledge: Through didactic study and two separate applied experiences in professional public health settings, students will gain knowledge and skills required to perform as public health practitioners and/or researchers.

The M.P.H. program trains students to develop educational competencies established by the program's accrediting body, the Council on Education for Public Health. These competencies may be viewed at http://familymedicine.vcu.edu/epidemiology/mph/competencies/.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

The M.P.H. program student handbook is available upon request.

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at sophas.org (http://www.sophas.org) and submit a VCU supplemental application following instructions available at sophas.org**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.H.	Fall	Mar 15	GRE; TOEFL or IELTS for international students

In addition to the general admission requirements of the VCU Graduate School (p. 34), to be considered for admission, applicants must meet the following requirements:

1. Prior degree: Students must hold a bachelor's degree from an accredited institution, with a minimum GPA of 3.0 on a 4.0 scale in all undergraduate and any other graduate study. Official copies of transcripts for all prior degrees earned must be submitted to the VCU Office of Graduate Admissions.
2. GRE: Current GRE test results (taken within the past five years), with scores at or above the 75th percentile preferred in all components of the exam (i.e., minimum scores of 159 quantitative, 157 verbal and 4.5 analytical writing).
3. TOEFL: International students must submit TOEFL or IELTS scores. Minimum TOEFL score is 600 (paper-based), 250 (computer-based) or 100 (Internet-based); IELTS minimum score is 7.0. The PTE is also accepted with a minimum score of 65. Test score requirements may be waived for international students who have received a medical degree (M.D.) in the U.S. Contact the program coordinator for more information.

Students must also submit the following materials with their applications:

1. Letters of recommendation from three individuals who can assess applicant qualifications for graduate school; at least one academic reference is required, but two are preferred. Most appropriate are letters from past professors or work supervisors.
2. Current version of curriculum vitae or resume. Include experience and/or education relevant to study in public health.
3. Personal statement covering the following issues in two to five pages:
   a. Description of the applicant's career goals
   b. Why the applicant wishes to pursue an M.P.H. degree
   c. How an M.P.H. degree will help the applicant achieve her/his career goals
   d. Description of applicant's particular areas of interest in public health (e.g., maternal and child health, epidemiology)
   e. Why VCU's M.P.H. program best fits the student's public health interests
   f. What applicant plans to do in the first few years after graduation

Degree requirements

The Master of Public Health program prepares students committed to public health careers in the public, private or nonprofit sectors. Public health works to prevent health problems in populations before these problems occur. The M.P.H. program provides a rigorous curriculum to help students develop the analytic and critical reasoning skills to improve population health. The program boasts experiential learning, a highly interactive environment, accessible and approachable faculty and student involvement in significant projects.

In addition to general VCU Graduate School graduation requirements (p. 31), a minimum of 45 credit hours of formal course work is required, including:

1. A practicum in year one
2. An internship, typically conducted in the summer between the first and second year
3. A 20-hour community-based learning experience
4. Attendance at public health seminars in years one and two
5. A capstone project planned and implemented in the second year of the program.

The M.P.H. program can be individualized to meet the varied needs and interests of students. The program offers many electives, allowing students to tailor the program to meet educational objectives, and it is flexible enough to accommodate students who enter the program with various backgrounds and experiences. Note that some elective courses may not be available in certain years or may require instructor permission for registration.

Curriculum requirements

Course	Title	Hours
Program requirements		
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 548	Applied Data Analysis Lab II	1.5
EPID 571	Principles of Epidemiology	3
EPID 580	Public Health Ethics	1
EPID 593	Foundations of the Public Health Profession	2
EPID 594	MPH Practicum	2
EPID 604	Principles of Environmental Health	3
HCPR 601	Introduction to Health Policy	3
IPEC 501	Foundations of Interprofessional Practice	1
SBHD 605	Introduction to Social and Behavioral Health	3
Electives		
Select a minimum of 12 credit hours of elective course work chosen according to the area(s) of interest in public health. These may include the following courses:		12
BIOS 549	Spatial Data Analysis	
BIOS 571	Clinical Trials	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
EPID 600	Introduction to Public Health	
EPID 601	Contemporary Issues and Controversies in Public Health	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
EPID 622	Maternal and Child Health	
EPID 624	Chronic Disease Epidemiology	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 691	Special Topics	
EPID 692	Independent Study	
GRAD 614	Introduction to Grant Writing	
GRTY 501	Physiological Aging	
GRTY 510	Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
HEMS 505	Contemporary Issues in Health	
HEMS 550	Exercise, Nutrition and Weight Management	
HEMS 604	Nutrition for Health and Physical Activity	
HEMS 605	Psychology of Physical Activity	
HEMS 606	Psychosocial Aspects of Sport and Physical Activity	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
PSYC 660	Health Psychology	
SBHD 608	Health Communication	
SBHD 609	Research Methods in Social and Behavioral Health I	
SBHD 611	Health Literacy	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
SBHD 632	Health Disparities and Social Justice	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	
SBHD 638	Applications in Qualitative Research Methods	
SOCY 510	Domestic and Sexual Violence in Social Context	
SOCY 524	Aging and the Minority Community	
SOCY 603	Seminar in Population Studies	
SOCY 607	Seminar in Racial and Ethnic Relations in America	
SOCY 611	Studies in the Community	
SOCY 620	Seminar in Criminology	

SOCY 624	Community and Community Services for the Elderly	
SOCY 632	Intimate Partner and Sexual Violence: Medical Practice and Policy	
SOCY 633	Application of the Policy Process to Issues of Violence	
SOCY 634	Social Contexts of Childhood and Violence	
SOCY 635	Theorizing Gender Violence	
SOCY 645	The Sociology of Health and Illness	
URSP 521	Introduction to Geographic Information Systems	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 625	Spatial Database Management and GIS Modeling	
Integrative program requirements		
EPID 693	Public Health Internship	3
EPID 694	MPH Capstone Project	3
Total Hours		45

Total graduate credit hours required (minimum) 45

Public health internship: The public health internship is a supervised experience designed to expose M.P.H. students to a real-world public health practice setting, such as a governmental public health agency or nonprofit organization, requiring them to integrate classroom knowledge and skills in practical applications in a professional environment. Each student intern works with a practice site supervisor who assigns tasks, instructs the student in new skills and evaluates the student's progress. Students work a minimum of 180 hours in a professional public health organization.

Capstone project: The culminating work in the M.P.H. program is the capstone project. The project is a practical experience that allows the student to apply what has been learned in the didactic components of the curriculum to a focused project. The goal is to enhance the student's academic experience through the application of public health concepts and skills in a supervised experience. Students are required to synthesize the literature; analyze, assess or evaluate quantitative or qualitative data; and in general apply theory and integrate knowledge gained and principles in situations that approximate some aspects of professional practice. With this mentored experience, students are able to both broaden their skills and hone their proficiency in a specific area of public health. The major product of this culminating experience is expected to vary depending on the educational goals of the student, but could include one of the following:

1. Manuscript suitable for publication in a peer-reviewed journal
2. Comprehensive disease-related report and analysis
3. Policy analysis report
4. Needs assessment for a specific population
5. Development, implementation and analysis of target population surveys
6. Program evaluation

At a minimum, the capstone experience will require the integration of multiple major competencies used by a public health professional. In fulfilling the capstone requirement, each candidate must: (a) submit a formal written paper of sufficient depth and rigor and (b) satisfactorily complete a poster presentation of the project chosen as the basis for the written paper at an appropriate venue (e.g., research forum, refereed conference, etc.) approved by the M.P.H. program director.

Non-didactic program requirements

In addition to course work, students are required to complete the following noncurricular requirements for the M.P.H. degree:

1. Attendance at 12 public health seminars
2. Twenty hours of community-based service-learning

Graduate program director
Juan Lu, Ph.D., M.P.H., M.D.
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Additional contact
Lisa S. Anderson
Director of educational programs, Division of Epidemiology, Department of Family Medicine and Population Health
lisa.s.anderson@vcuhealth.org
(804) 628-2512

Program website: epidemiology.vcu.edu/education/mph (http://www.epidemiology.vcu.edu/education/mph)

Public Health, Master of (M.P.H.)/Social Work, Master of (M.S.W.) [combined]

Program accreditation
Council on Education for Public Health (M.P.H.)
Council on Social Work Education (M.S.W.)

To qualify as a dual-degree student in any of the training paradigms which appear in the Bulletin, a student must have evidence of having been simultaneously enrolled in one or more courses of both of the programs constituting the "dual degree" for at least one semester.

Through a collaborative program between the VCU School of Social Work and the Division of Epidemiology in the School of Medicine's Department of Family Medicine and Population Health, students complete a three-year full-time program of study, including summer course work, to obtain the Master of Social Work and Master of Public Health degrees. The purpose of this dual-degree program is to prepare graduates to work with individuals, families, groups, communities and/or organizations; advocate for social, health care and economic justice in a diverse and multicultural society; and promote physical and mental health across the life course.

Prospective students are required to apply separately to both programs through the appropriate application portal indicated in the admission requirements section of this Bulletin and must meet both sets of admission requirements. Once admitted to both programs, the student is assigned an adviser from each to develop a plan of study, typically starting with the M.S.W. course work. It is preferable that students apply to both programs at the same time so that the structured dual-degree curriculum can be optimally planned. Students in one program may also apply to the second program during the first year of study.

Students are required to complete a minimum of 45 M.S.W. credit hours and a minimum of 36 M.P.H. credit hours, for a total of 81 semester credit hours. In the M.P.H. program, this includes 27 credit hours of core and required courses, a minimum six credit hours of elective courses and a minimum of three credit hours of a capstone project that examines a relevant public health topic. Note that some elective courses may not be available in certain years or may require instructor permission for registration. During the third and last year of study, dual-degree students are placed in internships through the School of Social Work that focus on public health; the internship placement is approved by both the M.P.H. program director and the director of the M.S.W. field instruction. With adviser approval, the student may develop a capstone project based on work in this public health/social work placement.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **master's programs** is available elsewhere in this chapter of the Graduate Bulletin.

For the M.P.H., apply online at sophas.org (http://www.sophas.org) and submit a supplemental VCU application following instructions available at sophas.org**; for the M.S.W., apply online at** graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Please review the admission requirements for each stand-alone degree (Master of Public Health and Master of Social Work) in the VCU Graduate Bulletin to learn the specific application requirements for each program.

Curriculum requirements

Course	Title	Hours
Program core		
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 548	Applied Data Analysis Lab II	1.5
EPID 571	Principles of Epidemiology	3
EPID 580	Public Health Ethics	1
EPID 593	Foundations of the Public Health Profession	2
EPID 594	MPH Practicum	2
EPID 604	Principles of Environmental Health	3
EPID 694	MPH Capstone Project	3
HCPR 601	Introduction to Health Policy	3
IPEC 501	Foundations of Interprofessional Practice	1
SBHD 605	Introduction to Social and Behavioral Health	3
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3

SLWK 693	Foundation Field Instruction I	3
SLWK 694	Foundation Field Instruction II	3
Concentration courses		
Select one of the following concentrations:		9
M.S.W. clinical concentration:		
SLWK 703	Mental, Emotional and Behavioral Disorders	
SLWK 704	Clinical Social Work Practice I	
SLWK 705	Clinical Social Work Practice II	
M.S.W. SWAPPP concentration:		
SLWK 711	Strategies for Social Work Planning and Administrative Practice	
SLWK 712	Social Work Planning and Administrative Practice I	
SLWK 713	Social Work Planning and Administrative Practice II	
SLWK 793	Concentration Field Instruction I	3
SLWK 794	Concentration Field Instruction II	3
Additional program courses		
Electives		
Select a minimum of six graduate elective credits from the following:		6
BIOS 549	Spatial Data Analysis	
BIOS 571	Clinical Trials	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
EPID 600	Introduction to Public Health	
EPID 601	Contemporary Issues and Controversies in Public Health	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
EPID 622	Maternal and Child Health	
EPID 624	Chronic Disease Epidemiology	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 692	Independent Study	
GRAD 614	Introduction to Grant Writing	
GRTY 501	Physiological Aging	
GRTY 510	Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
HEMS 505	Contemporary Issues in Health	
HEMS 550	Exercise, Nutrition and Weight Management	
HEMS 604	Nutrition for Health and Physical Activity	
HEMS 605	Psychology of Physical Activity	
HEMS 606	Psychosocial Aspects of Sport and Physical Activity	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
PSYC 660	Health Psychology	
SBHD 608	Health Communication	
SBHD 609	Research Methods in Social and Behavioral Health I	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
SBHD 632	Health Disparities and Social Justice	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	
SBHD 638	Applications in Qualitative Research Methods	
SOCY 510	Domestic and Sexual Violence in Social Context	
SOCY 524	Aging and the Minority Community	
SOCY 603	Seminar in Population Studies	
SOCY 607	Seminar in Racial and Ethnic Relations in America	
SOCY 611	Studies in the Community	
SOCY 620	Seminar in Criminology	
SOCY 624	Community and Community Services for the Elderly	
SOCY 632	Intimate Partner and Sexual Violence: Medical Practice and Policy	
SOCY 633	Application of the Policy Process to Issues of Violence	
SOCY 634	Social Contexts of Childhood and Violence	
SOCY 635	Theorizing Gender Violence	
SOCY 645	The Sociology of Health and Illness	
URSP 521	Introduction to Geographic Information Systems	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
URSP 625	Spatial Database Management and GIS Modeling	

Noncurricular requirements

In addition to course work, students must attend 12 public health seminars and complete 20 hours of community-based service-learning.

Total graduate credit hours required (minimum) for combined M.P.H./M.S.W. 81

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study, or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate

program directors or advisers for information about typical plans of study and registration requirements.

Graduate program directors
Juan Lu, Ph.D., M.P.H., M.D.
Associate professor, Division of Epidemiology, Department of Family Medicine and Population Health
juan.lu@vcuhealth.org
(804) 828-9786

Sarah K. Price, Ph.D.
M.S.W./M.P.H. combined program coordinator
skprice@vcu.edu
(804) 828-0579

Additional contact
Lisa S. Anderson, M.P.H.
Director of educational programs, Division of Epidemiology, Department of Family Medicine and Population Health
lisa.s.anderson@vcuhealth.org
(804) 628-2512

Program websites: familymedicine.vcu.edu/epidemiology/mph/dual-degrees and socialwork.vcu.edu (http://www.socialwork.vcu.edu)

Social and Behavioral Sciences, Doctor of Philosophy (Ph.D.)

Program goal

Training to be social and behavioral scientists

Students in the doctoral program in social and behavioral sciences will acquire the skills to become scientists, educators and scientists/administrators in a broad spectrum of positions and settings. Students will gain a progressive mastery of the current state of the subject matter in the social and behavioral sciences, an ability to synthesize the information and apply this foundation to the identification of key areas of investigation/experimentation and the ability to design and interpret studies that address the questions identified. In addition, students will develop the various means of communicating core social and behavioral science knowledge and particular study designs, results and interpretations to a variety of audiences.

Student learning outcomes

1. Analytical thinking: Students will demonstrate an appropriate level of ability to interpret information relevant to social and behavioral science, to connect rationales to procedures and evidence to findings, to draw reasonable conclusions, and to generate and evaluate alternate explanations.
2. Integrated knowledge of social and behavioral science: Students will demonstrate an appropriate level of knowledge of the current elements of the social and behavioral sciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique.
3. Oral communication skills: Students will demonstrate the achievement of an appropriate level of skill in the oral communication of social and behavioral science subject matter with respect to content, organization, logical flow, presentation, use of language and incorporation of visual aids in formal and collaborative communication.
4. Study design: Students will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement study protocols and to design and develop studies.
5. Written communication skills: Students will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling, vocabulary and use of figures, tables and citations to effectively present social and behavioral science information.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on **doctoral programs** is available elsewhere in this chapter of the Graduate Bulletin.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 9 (Priority consideration given to applications received by the deadline. Interviews will be conducted in February and March.)	GRE

Special requirements

- M.P.H. or equivalent M.A. or M.S. degree

Applicants must meet all general admission requirements of the VCU Graduate School (p. 34).

Degree requirements

The Ph.D. program in social and behavioral sciences, the only one of its kind in Virginia, prepares students to conduct theoretically based research and interventions on the social and behavioral determinants of health and disease. In addition to the general VCU Graduate School graduation requirements (p. 31), a minimum of 54 post-master's credit hours is required for the doctoral degree, which is expected to involve four years of full-time study.

Curriculum requirements

Course	Title	Hours
Program core		
SBHD 609	Research Methods in Social and Behavioral Health I	3
SBHD 619	Research Methods in Social and Behavioral Health II	3
SBHD 630	Theoretical Foundations of Social and Behavioral Health	3
SBHD 637	Program Evaluation	3
SBHD 638	Applications in Qualitative Research Methods	3
SBHD 639	Intervention Development and Implementation	3
Additional program courses		
BIOS 543 & BIOS 544	Graduate Research Methods I and Graduate Research Methods II	6
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
SBHD 632	Health Disparities and Social Justice	3
SBHD 634	Patient-Provider Interaction [1]	3
SBHD 636	Community-based Participatory Research [1]	3
SBHD 640	Seminar in Mixed Methods Research	1
SBHD 690	Departmental Seminar (one credit course taken four times)	4
SBHD 697	Directed Research in Social and Behavioral Health (9 credits minimum)	9
Electives		
Any graduate-level courses approved by adviser		6
Total Hours		54

[1] SBHD 692 may be taken if subject matter is appropriate; see adviser for approval.

Total graduate credit hours required (minimum) 54

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the nature of research being conducted or the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program director or adviser for information about typical plans of study and registration requirements. This program has a typical time to degree of four years. For additional information, see the departmental website (http://hbp.vcu.edu/education/phd-behavioralhealth).

Graduate program director
Maria Thomson, Ph.D.
Assistant professor, Department of Health Behavior and Policy
maria.thomson@vcuhealth.org

Additional contact
Kate Grant
Education coordinator
kate.grant@vcuhealth.org
(804) 828-5329

Program website: hbp.vcu.edu (http://hbp.vcu.edu)

Combined Master of Science (M.S.)/ Doctor of Philosophy (Ph.D.) and Doctor of Dental Surgery (D.D.S.)

In cooperation with the School of Dentistry, students in dentistry with an interest in academic and research careers are afforded the opportunity to undergo advanced degree training while in dental school or residency. Admission of students enrolled in the School of Dentistry to combined degree programs is processed through the Office of Graduate Education of the School of Medicine by established procedures. The Dental Aptitude Test may be accepted in lieu of the GRE as an admission requirement. No application fee is required of students already regularly enrolled as degree-seeking graduate students at the university.

The requirements for a combined professional school/graduate school degree in basic health sciences are equivalent to those required of students seeking a graduate degree alone and are determined by the individual departments.

Department of Anatomy and Neurobiology

John Povlishock, Ph.D.
Professor and chair

anatomy.vcu.edu (http://www.anatomy.vcu.edu)

The Department of Anatomy and Neurobiology offers neuroscience education for Ph.D. students and exciting research opportunities for postdoctoral scientists that span cellular to systems neuroscience. The department houses a large number of the university's neuroscientists and maintains dynamic research groups in glial cell biology, plasticity, development and circuitry, and central nervous system injury and repair.

- Anatomy and Neurobiology, Master of Science (M.S.) (p. 667)
- Anatomy and Neurobiology, Master of Science (M.S.) with a concentration in molecular biology and genetics (p. 669)

Department of Biochemistry and Molecular Biology

Sarah Speigel, Ph.D.
Professor and chair

biochemistry.vcu.edu (http://www.biochemistry.vcu.edu)

The Department of Biochemistry and Molecular Biology is home to a community of dedicated scientists, students and postdoctoral fellows who conduct innovative research on biochemical and molecular mechanisms governing cellular processes. The department offers a strong collegial atmosphere where faculty, students, postdoctoral fellows and administrators work together to promote and share in the discovery of fundamental principles governing life processes.

- Biochemistry, Doctor of Philosophy (Ph.D.) (p. 671)
- Biochemistry, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics (p. 674)
- Biochemistry, Master of Science (M.S.) (p. 676)
- Biochemistry, Master of Science (M.S.) with a concentration in molecular biology and genetics (p. 678)

Department of Biostatistics

Shumei S. Sun, Ph.D.
Professor and chair

biostatistics.vcu.edu (http://www.biostatistics.vcu.edu)

The Department of Biostatistics is committed to excellence in providing a graduate training program, conducting multidisciplinary collaborative biomedical research and developing new statistical methods. The department offers M.S. and Ph.D. programs in biostatistics, with concentrations in genomic biostatistics concentration at both levels and an additional concentration in clinical research and biostatistics at the master's level. The majority of the department's graduate students are supported through collaborative projects and partnerships with industry. The department also has a National Research Service Award pre-doctoral training program funded by the National Institute of Environmental Health Sciences. The purpose of this award is to train students to develop analytic methods for the study of chemical mixtures and analysis of toxicogenomic data. One faculty member also has a regular research grant funded in this area by the NIEHS.

- Biostatistics, Doctor of Philosophy (Ph.D.) (p. 681)
- Biostatistics, Doctor of Philosophy (Ph.D.) with a concentration in genomic biostatistics (p. 683)
- Biostatistics, Master of Science (M.S.) (p. 686)
- Biostatistics, Master of Science (M.S.) with a concentration in clinical research and biostatistics (p. 688)
- Biostatistics, Master of Science (M.S.) with a concentration in genomic biostatistics (p. 689)

Department of Family Medicine and Population Health

Anton J. Kuzel, M.D.
Professor and chair

familymedicine.vcu.edu (http://www.familymedicine.vcu.edu)

The Department of Family Medicine and Population Health hosts both a robust residency program for family physicians and academic programs at the graduate level dealing with critical issues in public health. Within the department, the Division of Epidemiology integrates research, education and public health service programs. The department offers a Ph.D. degree in epidemiology along with a fully accredited Master of Public Health degree. Close ties to the Virginia Department of Health allow opportunities for students to immerse themselves in experiential learning with these public health partners. The doctoral training program in epidemiology cultivates public health scientists equipped to use state-of-the-art research methods for the purpose of advancing fundamental knowledge of issues central to the improvement of population health.

- Epidemiology, Doctor of Philosophy (Ph.D.) (p. 692)
- Public Health, Master of (M.P.H.) (p. 757)
- Public Health, Master of (M.P.H.)/Social Work, Master of (M.S.W.) [combined] (p. 760)
- Medicine, Doctor of (M.D.)/Public Health, Master of (M.P.H.) [combined] (p. 723)
- Pharmacy, Doctor of (Pharm.D.)/Public Health, Master of (M.P.H.) [combined] (p. 748)

Department of Health Behavior and Policy

Vanessa Sheppard, Ph.D.
Professor and chair

hbp.vcu.edu (http://hbp.vcu.edu)

The Department of Health Behavior and Policy's mission is to transform the health landscape through multidisciplinary research, education and service. The department's research identifies the behavioral, social, organizational and policy factors that affect the health of individuals and populations. Faculty members and students utilize rigorous quantitative and qualitative methods and engage diverse communities to develop and evaluate programs and policies designed to promote health, improve health care delivery and reduce health disparities. Research findings inform the translation of effective programs and policies into practice. The department provides training to and promotes excellence in the next

generation of health behavior and policy practitioners, educators and scientists.

- Healthcare Policy and Research, Doctor of Philosophy (Ph.D.) (p. 698)
- Social and Behavioral Sciences, Doctor of Philosophy (Ph.D.) (p. 763)

Department of Human and Molecular Genetics

Paul B. Fisher, Ph.D.
Professor and chair

gen.vcu.edu (http://www.gen.vcu.edu)

The Department of Human and Molecular Genetics provides multifaceted research activities focusing on important areas of current medical and basic research. Our faculty members conduct research and clinical and educational activities at the VCU Medical Center, the Virginia Institute for Psychiatric and Behavioral Genetics and the VCU Institute of Molecular Medicine. Genetic counselors and medical genetics faculty conduct their outpatient counseling, medical genetics practice and inpatient pediatrics service at the VCU Medical Center and affiliated outpatient clinics.

- Genetic Counseling, Master of Science (M.S.) (p. 695)
- Human Genetics, Doctor of Philosophy (Ph.D.) (p. 700)
- Human Genetics, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics (p. 702)
- Human Genetics, Doctor of Philosophy (Ph.D.) with a concentration in quantitative human genetics (p. 704)
- Human Genetics, Master of Science (M.S.) (p. 710)
- Human Genetics, Master of Science (M.S.) with a concentration in molecular biology and genetics (p. 715)
- Human Genetics, Doctor of Philosophy (Ph.D.)/Genetic Counseling, Master of Science (M.S.) [dual degree] (p. 707)

Department of Microbiology and Immunology

Dennis E. Ohman, Ph.D.
Professor and chair

microbiology.vcu.edu (http://microbiology.vcu.edu)

The Department of Microbiology and Immunology is focused on research, cutting-edge technologies and educational programs with emphasis on microbial pathogens, cancer and the host immune defense system, which protects individuals from disease. The training is rigorous, emphasizing conceptual and experimental strategies using state-of-the-art technologies in modern facilities.

Departmental microbiologists study the molecular mechanisms by which microorganisms (i.e., bacteria, viruses, fungi and parasites) colonize a host, evade the immune response and cause damage. Immunologists in the department study the molecular and cellular mechanisms by which the immune response either defends the host against pathogens or goes awry, such as with an allergic reaction. Many of the department's molecular cell biologists are studying the fundamentals of cancer and new therapeutic approaches. All conduct research using the tools of molecular biology, genetics, cell culture, infection models, transgenic animals and bioinformatics.

A major goal of the department is to train the next generation of research scientists. Ph.D. students and postdoctoral fellows work alongside principal investigators to test hypotheses of medical importance. Laboratory training is supplemented with rigorous course work, seminars, journal clubs and lab meetings. Most trainees present their research findings at national and international meetings.

- Microbiology and Immunology, Doctor of Philosophy (Ph.D.) (p. 727)
- Microbiology and Immunology, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics (p. 729)
- Microbiology and Immunology, Master of Science (M.S.) (p. 731)
- Microbiology and Immunology, Master of Science (M.S.) with a concentration in molecular biology and genetics (p. 734)

Department of Pathology

Charles V. Clevenger, M.D., Ph.D.
Professor and chair

pathology.vcu.edu (http://www.pathology.vcu.edu)

The Department of Pathology is a diverse clinical, research and teaching department within the School of Medicine. The department offers a full range of pathology services to physicians, researchers and patients at the VCU Health System, a 780-bed tertiary-care urban teaching hospital dedicated to serving the patients and physicians of central Virginia. The 47 faculty members supervise 14 hospital laboratories including histopathology, neuropathology, cytopathology, autopsy pathology, molecular diagnostics, cytogenetics, hematology, coagulation, microbiology, immunology, clinical chemistry, toxicology and transfusion medicine staffed by more than 350 hospital employees. The department faculty conduct a robust array of research programs in numerous areas and participate in student training through a variety of mechanisms.

Department of Pharmacology and Toxicology

William L. Dewey, Ph.D.
Professor and chair

pharmtox.vcu.edu (https://pharmtox.vcu.edu)

The Department of Pharmacology and Toxicology is home to a community of researchers, students and faculty who strive to improve the treatment of medical disorders through a better understanding of the pharmacology of agents and by developing safer and more effective drugs. The department has educated alumni who have gone on to distinguished careers in government, academia and the private sector as researchers, educators and consultants. The work these students do at VCU and beyond has the potential to improve the health and well-being of people all over the world.

- Pharmacology and Toxicology, Doctor of Philosophy (Ph.D.) (p. 739)
- Pharmacology and Toxicology, Doctor of Philosophy (Ph.D.) with a concentration in molecular biology and genetics (p. 741)
- Pharmacology and Toxicology, Master of Science (M.S.) (p. 743)
- Pharmacology and Toxicology, Master of Science (M.S.) with a concentration in molecular biology and genetics (p. 746)

Department of Physiology and Biophysics

Clive M. Baumgarten, Ph.D.
Professor and interim chair

physiology.vcu.edu (http://www.physiology.vcu.edu)

The Department of Physiology and Biophysics brings a long tradition to the study of physiology that spans the entire spectrum from molecules to man. Strong research programs exist in molecular biophysics, cardiovascular and gastrointestinal physiology as well as in chemical senses. Faculty recruitments are ongoing in two areas: structural biology, which aims to understand function in terms of structure, and systems physiology, which aims to elucidate fundamental ways of communication within and between physiological systems. Biophysical approaches serve as the common language used at all levels of scientific inquiry. The department offers a strong collegial atmosphere where faculty, students, postdoctoral fellows and administrators work together to promote and share in the discovery of fundamental principles governing life processes.

- Physiology and Biophysics, Doctor of Philosophy (Ph.D.) (p. 751)
- Physiology and Biophysics, Master of Science (M.S.) (p. 753)

Department of Radiation Oncology

Mitchell Anscher, M.D.
Florence and Hyman Meyers Endowed Chair

The Department of Radiation Oncology is a key unit in the Massey Cancer Center, a National Cancer Institute-designated unit directed to the delivery of effective treatment modalities, research critical to improvement in the treatment of cancer and the education of physicians and scientists who specialize in this critical area. The department includes a Clinical Division, focusing on the delivery of advanced radiotherapy services to patient populations, the Division of Molecular Radiobiology and Targeted Imaging, conducting research to refine the understanding of the cellular response to radiation and the development of functional targeted imaging to enhance therapy, and the Division of Medical Physics, which integrates research into methods to improve radiotherapy with Ph.D. training in medical physics.

- Medical Physics, Doctor of Philosophy (Ph.D.) (p. 718)
- Medical Physics, Master of Science (M.S.) (p. 721)
- Medical Physics, Certificate in (Post-baccalaureate graduate certificate) (p. 717)

SCHOOL OF NURSING

The School of Nursing originated in 1893 as part of the University College of Medicine. Since then, the educational program has evolved from a basic diploma program to multiple programs at the baccalaureate-, master's- and doctoral-degree levels. Additionally, the School of Nursing offers post-master's certificate programs. The School of Nursing takes pride in its long history of service to the profession of nursing and continues to be a leader in nursing education in Virginia.

Administration

1100 East Leigh Street
Box 980567
Richmond, Virginia 23298-0567
Phone: (804) 828-0724
Fax: (804) 828-7743
nursing.vcu.edu (http://www.nursing.vcu.edu)

Jean Giddens, Ph.D., RN, FAAN
Dean

Debra Barksdale, Ph.D., FNP-BC, CNE, FAANP, FAAN
Professor and associate dean of academic programs

Deborah B. McGuire, Ph.D., RN, FAAN
Associate dean for research

Jeannetta Hollins, Ph.D.
Director, Office of Student Success

Accreditation

The baccalaureate degree in nursing, master's degree in nursing, post-master's certificate program and the Doctor of Nursing Practice program at the VCU School of Nursing are accredited by the Commission on Collegiate Nursing Education (http://www.aacn.nche.edu/ccne-accreditation).

The pre-licensure nursing program is approved by the Virginia Board of Nursing (http://www.dhp.virginia.gov/nursing).

Programs

The School of Nursing offers Bachelor of Science, Master of Science, post-master's certificate, Doctor of Philosophy and Doctor of Nursing Practice programs. Curricula and admissions information pertaining to all of these programs is available on this website and may be accessed using the program index feature at the top of this page.

Further information may be obtained by visiting the School of Nursing website at nursing.vcu.edu (http://www.nursing.vcu.edu) or by writing to Virginia Commonwealth University, School of Nursing, Office of Enrollment and Student Services, Box 980567, Richmond, VA 23298-0567.

Facilities and resources

The faculty and administrative offices of the school are housed at 1100 E. Leigh St. Additionally, this building has a nursing clinical resource laboratory and classrooms equipped with a full range of audiovisual equipment. Both graduate and undergraduate courses are also scheduled in other classrooms on campus.

The clinical laboratories for nursing courses are conducted at the VCU Medical Center and in numerous other urban and rural hospitals and health agencies in the area, including community medical centers and state hospitals, public health services, private clinics and offices, and federal and state centers and departments. These facilities provide generalized and specialized inpatient and ambulatory services. Students are given a range of diverse experiences in hospital and community-oriented nursing. Selection of specific facilities for student experience is based upon curricular and advanced-practice certification requirements, the educational needs of the individual student and the services available.

Financial assistance

Applications for financial assistance must be filed for all forms of financial assistance. A Free Application for Federal Student Aid may be obtained from the Office of Financial Aid, Virginia Commonwealth University, Richmond, VA 23298-0244 or online at fafsa.ed.gov (https://fafsa.ed.gov).

Financial assistance is available through scholarships, fellowships and assistantships administered by the School of Nursing. Additional information may be found on the school's website at nursing.vcu.edu/admission/scholarships-and-financial-aid (http://nursing.vcu.edu/admission/scholarships-and-financial-aid).

Departments

Department of Adult Health and Nursing Systems

Beth Rodgers, Ph.D., RN, FAAN
Professor and chair

Department of Family and Community Health Nursing

Christine Wynd, Ph.D., RN
Professor and chair

Graduate information

Nondegree-seeking students

Students who have not been admitted to a graduate program in nursing may be admitted to individual courses. Permission to register for courses is granted at the discretion of the School of Nursing. Only six credits earned as a nondegree-seeking student can be applied to the master's degree. Only three credits may be earned by post-master's students prior to admission.

Enrollment

Students may begin study during the fall semester. Students will have an academic adviser appointed and will follow the standard program of study. Once admitted, students are expected to abide by enrollment policies of the Graduate School.

Nursing, Certificate in (Post-master's certificate) with a concentration in adult-gerontology acute care nurse practitioner

The VCU School of Nursing adult-gerontology acute care nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to manage acutely ill adults, ranging from adolescents to the elderly, through all phases of their hospitalization. Students learn to manage patients through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures, and implementation of evidence-based treatment strategies. Graduates of the AGACNP concentration are prepared to diagnose and manage complex health problems of adults across the life span, including acute/critical illness and injuries, as well as exacerbations of chronic conditions.

The AGACNP generally works in an acute care setting, often within a multidisciplinary team focused on the provision of evidence-based care to adults who are acutely ill. The sphere of influence of the nurse practitioner is that of the patient.

Graduates of the AGACNP concentration are eligible to apply for certification as an AGACNP by the American Nurses Credentialing Center or the American Association of Critical-Care Nurses.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking

applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/post-masters-certificate)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Spring	Sep 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's or doctoral nursing degree program (Applicants to the post-master's certificate nurse practitioner concentrations must hold a master's or doctoral degree as an advanced practiced registered nurse (NP or CNS) from an accredited [ACEN, CCNE or CNEA] program.)
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Degree requirements

Twenty-five graduate credit hours are required for the post-master's certificate in nursing with a concentration in adult-gerontology acute care nurse practitioner.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Certificate in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Students in nurse practitioner certification concentrations are required to have completed advanced health assessment, pharmacotherapeutics and pathophysiology courses.

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 612	Acute Care Advanced Practice Clinical Procedures	1
NURS 618	Diagnosis and Management in Adult-Gerontology Acute Care I	3
NURS 619	Diagnosis and Management in Adult-Gerontology Acute Care II	3
NURS 620	Gero-pharmacology	1
NURS 662	Diagnosis and Management in Adult-Gerontology Critical Care	4
NURS 678	Adult-Gerontology Acute Care Practicum I	3
NURS 669	Adult-Gerontology Acute Care Practicum II	4
NURS 679	Adult-Gerontology Acute Care Practicum III	5
Total Hours		25

Total graduate credit hours required (minimum) 25

Graduate program director
Carla Nye, D.N.P., RN, CPNP-PC, CNE
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Phone: (804) 827-0629

Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/programs/post-masters-certificate (http://nursing.vcu.edu/programs/post-masters-certificate)

Nursing, Certificate in (Post-master's certificate) with a concentration in adult-gerontology primary care nurse practitioner

The VCU School of Nursing adult-gerontology primary care nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to diagnose and manage common acute and chronic health problems in adults, ranging from adolescents to the elderly. Students learn to manage patients through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures, and implementation of evidence-based treatment strategies, including health promotion and disease prevention.

The AGPCNP has a practice located in a variety of primary care settings, including college health services, health maintenance organizations, community clinics, long-term care, assisted living, continuing care retirement communities, occupational health settings and private practices.

Graduates of the AGPCNP concentration are eligible to apply for certification as an AGACNP by the American Nurses Credentialing Center or the American Association of Nurse Practitioners.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/post-masters-certificate)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Spring	Sep 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended

3. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's or doctoral nursing degree program (Applicants to the post-master's certificate nurse practitioner concentrations must hold a master's or doctoral degree as an advanced practiced registered nurse (NP or CNS) from an accredited [ACEN, CCNE or CNEA] program.)
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Degree requirements

Twenty-four graduate credit hours are required for the post-master's certificate in nursing with a concentration in adult-gerontology primary care nurse practitioner.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Certificate in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Students in nurse practitioner certification concentrations are required to have completed advanced health assessment, pharmacotherapeutics and pathophysiology courses.

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 615	Diagnosis and Management in Adult-Gerontology Primary Care I	3
NURS 616	Diagnosis and Management in Adult-Gerontology Primary Care II	3
NURS 617	Advanced Gerontology Primary Care Across the Care Continuum	4
NURS 620	Gero-pharmacology	1
NURS 676	Adult-Gerontology Primary Care Practicum I	3
NURS 675	Adult-Gerontology Primary Care Practicum II	4
NURS 677	Adult-Gerontology Primary Care Practicum III	5
Total Hours		24

Total graduate credit hours required (minimum) 24

Graduate program director
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Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/programs/post-masters-certificate (http://nursing.vcu.edu/programs/post-masters-certificate)

Nursing, Certificate in (Post-master's certificate) with a concentration in family nurse practitioner

The VCU School of Nursing family nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to diagnose and manage common acute and chronic health problems across the lifespan through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures and implementation of evidence-based treatment strategies, including health promotion and disease prevention.

The FNP is prepared to provide direct care to individuals and families in a variety of primary care settings, including college health services, health maintenance organizations, community clinics, long-term care, assisted living, continuing care retirement communities, occupational health settings, urgent care and private practices.

Graduates of the FNP concentration are eligible to apply for certification as a FNP by the American Nurses Credentialing Center or the American Academy of Nurse Practitioners.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes

5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/post-masters-certificate)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Spring	Sep 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's or doctoral nursing degree program (Applicants to the post-master's certificate nurse practitioner concentrations must hold a master's or doctoral degree as an advanced practiced registered nurse (NP or CNS) from an accredited [ACEN, CCNE or CNEA] program.)
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Degree requirements

Twenty-seven graduate credit hours are required for the Post-master's Certificate in Nursing with a concentration in family nurse practitioner.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Certificate in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Students in nurse practitioner certification concentrations are required to have completed advanced health assessment, pharmacotherapeutics and pathophysiology courses.

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 627	Foundational Perspectives of Family-centered Care	2
NURS 629	Diagnosis and Management in Family Primary Care I	4
NURS 630	Diagnosis And Management In Family Primary Care II	4
NURS 631	Primary Care of Select Populations	2
NURS 643	Family Primary Care Practicum I	6
NURS 644	Family Primary Care Seminar	1
NURS 645	Family Primary Care Practicum II	6
NURS 646	Family Primary Care Final Synthesis Seminar	1
Total Hours		27

Total graduate credit hours required (minimum) 27

Graduate program director
Carla Nye, D.N.P., RN, CPNP-PC, CNE
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Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/programs/post-masters-certificate (http://nursing.vcu.edu/programs/post-masters-certificate)

Nursing, Certificate in (Post-master's certificate) with a concentration in nursing administration and leadership

For students interested in a leadership role in a health care organization, the nursing administration and leadership concentration at the VCU School of Nursing offers a flexible and rewarding career path. Over the past three decades, this concentration has gained a reputation for educating some of the nation's top nursing leaders. With a vision of shaping the future of health care through innovative nursing leadership, the NAL concentration prepares nurses to play an essential systems-level role in promoting and sustaining high-quality and safe patient care. Students gain advanced knowledge and skills in the areas of leadership, administration, management, health care finance, budgeting, outcomes management and evidence-based organizational practices in health care.

Graduates of the NAL concentration are prepared to succeed in nursing leadership positions and are eligible, depending on employment role, to apply for several different nursing administration certification exams offered through the American Nurses Credentialing Center of the American Nurses Association or the American Organization of Nurse Executives.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/post-masters-certificate)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Spring	Sep 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's or doctoral nursing degree program (Applicants to the post-master's certificate nurse practitioner concentrations must hold a master's or doctoral degree as an advanced practiced registered nurse (NP or CNS) from an accredited [ACEN, CCNE or CNEA] program.)
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Degree requirements

Thirty-eight graduate credit hours are required for the Post-master's Certificate in Nursing with a concentration in nursing administration and leadership.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Certificate in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Course	Title	Hours
Core course		
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice (if not taken in master's program)	3
Concentration requirements		
NURS 609	Health Care Delivery and Reimbursement Systems for Nurse Leaders	3
NURS 613	Organizational Behavior and Leadership for Nurse Leaders	3
NURS 614	Organizational Systems and Leadership for Nurse Leaders	3
NURS 639	Health Informatics for Nurse Leaders	3
NURS 651	Decision Analysis for Quality Outcomes Across Populations	3
NURS 652	Health Care Managerial Finance I: For Nurse Leaders	3
NURS 653	Health Care Managerial Finance II: Economic Evaluation and Analysis	3
NURS 666	Strategic and Change Management for Quality Outcomes for Nurse Leaders	2

NURS 668	Human Resource and Customer Relationship Management for Nurse Leaders	3
NURS 695	Managing for Performance and Health Care Outcomes	3
NURS 696	Practicum I: Comparative Health Care Delivery Systems for Nurse Leaders	2
NURS 697	Practicum II: Comparative Interdisciplinary Health Care Leadership Roles	1
NURS 698	Practicum III: Applied Integrative Health Care Delivery Leadership	3
Total Hours		38

Total graduate credit hours required (minimum) 38

Graduate program director
Carla Nye, D.N.P., RN, CPNP-PC, CNE
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Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/programs/post-masters-certificate (http://nursing.vcu.edu/programs/post-masters-certificate)

Nursing, Certificate in (Post-master's certificate) with a concentration in psychiatric-mental health nurse practitioner

The psychiatric-mental health nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills in areas of mental health promotion, as well as mental illness prevention, assessment, diagnosis, treatment and patient education in the care of individuals across the lifespan. Students are exposed to a unique balance of neuroscience, psychological theory and evidence-based practice. Students crystalize their understanding of this content through the use of simulation, interactive case study, discussion board activity, individual and group-based projects, writing assignments, testing and supervised practicum experiences. Informed by a balanced approach to care, students receive focused instruction in both psychotherapy and psychopharmacotherapy.

The PMHNP is prepared to assess, diagnose, treat and educate individuals, families and groups with complex psychiatric-mental health problems and do so with an interprofessional lens of quality and safety. PMHNPs work in clinical settings that include private, state or Veterans Affairs in-patient or outpatient psychiatric facilities, private psychiatric practices, and community mental health centers. PMHMPs also provide services in settings such as correctional facilities, domestic violence shelters, residential substance abuse facilities and schools.

Graduates of the PMHNP concentration are eligible to apply for the Psychiatric and Mental Health Nurse Practitioner certification exam administered by the American Nurses Credentialing Center.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for

continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/post-masters-certificate)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Spring	Sep 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's or doctoral nursing degree program (Applicants to the post-master's certificate nurse practitioner concentrations must hold a master's or doctoral degree as an advanced practiced registered nurse (NP or CNS) from an accredited [ACEN, CCNE or CNEA] program.)
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Degree requirements

Twenty-three graduate credit hours are required for the Post-master's Certificate in Nursing with a concentration in psychiatric-mental health nurse practitioner.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Certificate in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Students in nurse practitioner certification concentrations are required to have completed advanced health assessment, pharmacotherapeutics and pathophysiology courses.

Course	Title	Hours
NURS 635	Advanced Practice Psychiatric Mental Health Nursing Practicum I	6
NURS 636	Advanced Practice Psychiatric Mental Health Nursing Seminar	3
NURS 637	Advanced Practice Psychiatric Mental Health Nursing Practicum II	6
NURS 656	Diagnosis and Management of Psychiatric Disorders Across the Lifespan	4
NURS 657	Advanced Practice Psychiatric Mental Health Nursing: Theory and Practice Across the Lifespan	4
Total Hours		23

Total graduate credit hours required (minimum) 23

Graduate program director

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Program website: nursing.vcu.edu/programs/post-masters-certificate (http://nursing.vcu.edu/programs/post-masters-certificate)

Nursing, Doctor of Philosophy (Ph.D.) with a concentration in biobehavioral research

The VCU School of Nursing Doctor of philosophy program in nursing prepares scholars to develop knowledge in the discipline of nursing to become teacher-scholars or pioneering researchers committed to the highest ideals of nursing excellence. The program examines knowledge development in nursing through an understanding of the impact of a wide range of historical influences on the discipline and through analysis of how emerging societal issues influence knowledge development. Knowledge in the humanities and social sciences and an understanding of knowledge development in other disciplines is viewed as foundational to a full understanding of knowledge development in nursing. Methodologic competency (i.e., knowledge of research designs, methodologies and tools) is also essential to a full understanding of the scope, range and path of knowledge development and the relevance to nursing practice.

The online Ph.D. program includes a combination of online courses and on-campus immersions each semester to offer students a dynamic, interactive learning experience that will prepare them to become nurse scholars and scientists. This format is designed to expand the Ph.D. program's reach to a wider range of highly motivated, independent students who aspire to become scholars, make a significant difference in the field of nursing and study with nationally recognized nurse scientists.

During the first year of the B.S. to Ph.D. option, there are some required face-to-face courses.

Student learning outcomes

Graduates will be able to:

1. Synthesize and critically appraise extant knowledge and theory
2. Design, conduct and disseminate theoretically sound research that is relevant, rigorous, culturally competent and consistent with standards of scientific integrity
3. Lead and collaborate in team science to develop knowledge that enhances health in ways that reflect nursing's unique perspective
4. Communicate effectively to the scientific community, policy-makers and the public through appropriate scholarly mechanisms

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for application instructions (http://nursing.vcu.edu/admission/application-instructions/phd)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Feb 1	
		Note: Applications may be accepted after the deadline on a space-available basis.	

To be considered for admission to the School of Nursing, applicants must:

1. Meet general admission requirements of the VCU Graduate School (p. 34)
2. Present a baccalaureate and/or a master's degree, one of which must be in nursing (The degree in nursing must be from an ACEN-, CCNE- or CNEA-accredited school. Graduates of international nursing schools and applicants who have studied outside of the U.S. are required to provide a course-by-course external credential evaluation from a VCU-recognized professional evaluator. The professional evaluation may not be older than two years at the time of application.)
3. Present a three-credit statistics course with a minimum grade of B
4. Present a current, unrestricted R.N. license or an authorization to practice as an R.N. in Virginia, the District of Columbia or a U.S. possession or territory (Graduates of international nursing schools who are not licensed in a state, the District of Columbia, or a U.S. possession or territory are required to obtain a VisaScreen Certificate issued by the Commission on Graduates of Foreign Nursing Schools.)
5. Present additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Applicants must complete and submit the following materials:

1. An application for graduate studies (Visit the School of Nursing website for **application instructions** (http://nursing.vcu.edu/admission/application-instructions/phd).)
2. Official transcripts from all previous universities and colleges attended for all graduate and undergraduate course work
3. A resume that includes name and address, past educational degrees, past work experiences, professional affiliations, certifications, honors and awards, presentations, and publications
4. References from three persons who can knowledgeably comment upon the applicant's ability to succeed in an academic program (e.g., former faculty) or who can evaluate the applicant's ability to be successful in nursing research (References from ministers or others who are not familiar with professional and academic abilities; from friends, either professional or personal; or from personal health care providers will not be reviewed.)

Note: A personal interview is required.

Degree requirements

A minimum of 58 graduate credit hours are required for the Ph.D. in Nursing program. Students entering the B.S.-to-Ph.D. option will complete an additional nine credits of course work for a total of 67 credits. Additionally, these students will take some required face-to-face courses during their first year of enrollment.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the doctoral degree in nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within eight calendar years of the first registration for course work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled, all fees to the university have been paid and electronic copies of the dissertation have been submitted. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirement

For students entering with a baccalaureate degree

Course	Title	Hours
Post-baccalaureate entry prerequisites		
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
NURS 610	Health Information and Emerging Health Care Technologies	3
Core courses		
NURS 638	Health Policy Leadership and Advocacy	3
NURS 700	Scientific Integrity: Responsible Conduct of Research	1
NURS 701	Statistical Methods for Nursing Research	3
NURS 702	Advanced Statistical Concepts for Nursing Research	3
NURS 703	Philosophy of Human Sciences	3
NURS 704	Analysis and Construction of Theory for Nursing Research	3
NURS 725	Synthesis and Emerging Trends in Scientific Inquiry	3
NURS 770	Quantitative Research	3
NURS 772	Qualitative Research	3
NURS 797	Practicum in Nursing Research	3
Research methods courses		
Select methods courses from any subject area with adviser approval. [1]		6
Concentration courses		
NURS 720	Foundations of Biobehavioral Research	3
NURS 721	Advanced Concepts in Biobehavioral Research	3
Electives		
Select courses designed to support the area of study. [1]		6

Dissertation		
NURS 898	Dissertation	12
Total Hours		67

[1]Of the six credits of methods courses and six credits of electives, a minimum of six credits must be taken in a discipline other than nursing. Electives must be approved by the student's adviser.

Total graduate credit hours required (minimum) 67

For students entering with a master's degree

Course	Title	Hours
Core courses		
NURS 638	Health Policy Leadership and Advocacy	3
NURS 700	Scientific Integrity: Responsible Conduct of Research	1
NURS 701	Statistical Methods for Nursing Research	3
NURS 702	Advanced Statistical Concepts for Nursing Research	3
NURS 703	Philosophy of Human Sciences	3
NURS 704	Analysis and Construction of Theory for Nursing Research	3
NURS 725	Synthesis and Emerging Trends in Scientific Inquiry	3
NURS 770	Quantitative Research	3
NURS 772	Qualitative Research	3
NURS 797	Practicum in Nursing Research	3
Research methods courses		
Select methods courses from any subject area with adviser approval. [1]		6
Concentration courses		
NURS 720	Foundations of Biobehavioral Research	3
NURS 721	Advanced Concepts in Biobehavioral Research	3
Electives		
Select courses designed to support the area of study. [1]		6
Dissertation		
NURS 898	Dissertation	12
Total Hours		58

[1]Of the six credits of methods courses and six credits of electives, a minimum of six credits must be taken in a discipline other than nursing. Electives must be approved by the student's adviser.

Total graduate credit hours required (minimum) 58

Comprehensive examination requirements

The purpose of the comprehensive examination is to test synthesis of foundational knowledge in preparation for launching a program of scholarship as a beginning scientist. Three knowledge domains are critical: a) theory and philosophy, b) qualitative and c) quantitative methodological approaches. The student's area of study is incorporated into these three domains. The comprehensive exam consists of two components, a written and an oral component, both of which must be passed. The oral exam will be conducted with the student either in person or via video conference.

Dissertation requirements

The student must conduct a substantial independent investigation and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. Satisfactory completion of the comprehensive examination and a satisfactory oral defense of the dissertation proposal are required prior to commencement of actual work outlined in the proposal. Once approved, the dissertation proposal is similar to a formal contract between the student and dissertation committee about the nature of the dissertation.

The dissertation committee must consist of a minimum of four members. A member of the graduate faculty of the School of Nursing who has an established program of research and prior experience on dissertation committees must chair a student's dissertation committee. Other committee members must include one faculty member from the student's focus area and one member from outside the School of Nursing. The dissertation committee is approved by the associate dean for academic programs in the School of Nursing. An oral defense of the dissertation is conducted by the student's dissertation committee. The student is responsible for preparing the dissertation in accordance with the most current version of the Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf).

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Program website: nursing.vcu.edu/programs/phd (http://nursing.vcu.edu/programs/phd)

Nursing, Doctor of Philosophy (Ph.D.) with a concentration in health care quality research

The VCU School of Nursing Doctor of philosophy program in nursing prepares scholars to develop knowledge in the discipline of nursing to become teacher-scholars or pioneering researchers committed to the highest ideals of nursing excellence. The program examines knowledge development in nursing through an understanding of the impact of a wide range of historical influences on the discipline and through analysis of how emerging societal issues influence knowledge development. Knowledge in the humanities and social sciences and an understanding of knowledge development in other disciplines is viewed as foundational to a full understanding of knowledge development in nursing. Methodologic competency (i.e., knowledge of research designs, methodologies and tools) is also essential to a full understanding of the scope, range and path of knowledge development and the relevance to nursing practice.

The online Ph.D. program includes a combination of online courses and on-campus immersions each semester to offer students a dynamic, interactive learning experience that will prepare them to become nurse

scholars and scientists. This format is designed to expand the Ph.D. program's reach to a wider range of highly motivated, independent students who aspire to become scholars, make a significant difference in the field of nursing and study with nationally recognized nurse scientists.

During the first year of the B.S. to Ph.D. option, there are some required face-to-face courses.

Student learning outcomes

Graduates will be able to:

1. Synthesize and critically appraise extant knowledge and theory
2. Design, conduct and disseminate theoretically sound research that is relevant, rigorous, culturally competent and consistent with standards of scientific integrity
3. Lead and collaborate in team science to develop knowledge that enhances health in ways that reflect nursing's unique perspective
4. Communicate effectively to the scientific community, policy-makers and the public through appropriate scholarly mechanisms

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for application instructions (http://nursing.vcu.edu/admission/application-instructions/phd)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Feb 1	
		Note: Applications may be accepted after the deadline on a space-available basis.	

To be considered for admission to the School of Nursing, applicants must:

1. Meet general admission requirements of the VCU Graduate School (p. 34)
2. Present a baccalaureate and/or a master's degree, one of which must be in nursing (The degree in nursing must be from an ACEN-, CCNE- or CNEA-accredited school. Graduates of international nursing schools and applicants who have studied outside of the U.S. are required to provide a course-by-course external credential evaluation from a VCU-recognized professional evaluator. The professional evaluation may not be older than two years at the time of application.)
3. Present a three-credit statistics course with a minimum grade of B
4. Present a current, unrestricted R.N. license or an authorization to practice as an R.N. in Virginia, the District of Columbia or a U.S. possession or territory (Graduates of international nursing schools who are not licensed in a state, the District of Columbia, or a U.S. possession or territory are required to obtain a VisaScreen Certificate issued by the Commission on Graduates of Foreign Nursing Schools.)
5. Present additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

Applicants must complete and submit the following materials:

1. An application for graduate studies (Visit the School of Nursing website for **application instructions** (http://nursing.vcu.edu/admission/application-instructions/phd)**.**)
2. Official transcripts from all previous universities and colleges attended for all graduate and undergraduate course work
3. A resume that includes name and address, past educational degrees, past work experiences, professional affiliations, certifications, honors and awards, presentations, and publications
4. References from three persons who can knowledgeably comment upon the applicant's ability to succeed in an academic program (e.g., former faculty) or who can evaluate the applicant's ability to be successful in nursing research (References from ministers or others who are not familiar with professional and academic abilities; from friends, either professional or personal; or from personal health care providers will not be reviewed.)

Note: A personal interview is required.

Degree requirements

A minimum of 58 graduate credit hours are required for the Ph.D. in Nursing program. Students entering the B.S.-to-Ph.D. option will complete an additional nine credits of course work for a total of 67 credits. Additionally, these students will take some required face-to-face courses during their first year of enrollment.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the doctoral degree in nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within eight calendar years of the first registration for course work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled, all fees to the university have been paid and electronic copies of the dissertation have been submitted. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirement

For students entering with a baccalaureate degree

Course	Title	Hours
Post-baccalaureate entry prerequisites		
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
NURS 610	Health Information and Emerging Health Care Technologies	3
Core courses		
NURS 638	Health Policy Leadership and Advocacy	3
NURS 700	Scientific Integrity: Responsible Conduct of Research	1
NURS 701	Statistical Methods for Nursing Research	3
NURS 702	Advanced Statistical Concepts for Nursing Research	3
NURS 703	Philosophy of Human Sciences	3
NURS 704	Analysis and Construction of Theory for Nursing Research	3
NURS 725	Synthesis and Emerging Trends in Scientific Inquiry	3
NURS 770	Quantitative Research	3
NURS 772	Qualitative Research	3
NURS 797	Practicum in Nursing Research	3
Research methods courses		
Select methods courses from any subject area with adviser approval. [1]		6
Concentration courses		
NURS 731	Foundations in Health Care Quality Research	3
NURS 732	Advanced Concepts in Health Care Quality Research	3
Electives		
Select courses designed to support the area of study. [1]		6
Dissertation		
NURS 898	Dissertation	12
Total Hours		67

[1]Of the six credits of methods courses and six credits of electives, a minimum of six credits must be taken in a discipline other than nursing. Electives must be approved by the student's adviser.

Total graduate credit hours required (minimum) 67

For students entering with a master's degree

Course	Title	Hours
Core courses		
NURS 638	Health Policy Leadership and Advocacy	3
NURS 700	Scientific Integrity: Responsible Conduct of Research	1
NURS 701	Statistical Methods for Nursing Research	3
NURS 702	Advanced Statistical Concepts for Nursing Research	3
NURS 703	Philosophy of Human Sciences	3
NURS 704	Analysis and Construction of Theory for Nursing Research	3
NURS 725	Synthesis and Emerging Trends in Scientific Inquiry	3
NURS 770	Quantitative Research	3
NURS 772	Qualitative Research	3
NURS 797	Practicum in Nursing Research	3
Research methods courses		
Select methods courses from any subject area with adviser approval. [1]		6
Concentration courses		

NURS 731	Foundations in Health Care Quality Research	3
NURS 732	Advanced Concepts in Health Care Quality Research	3
Electives		
Select courses designed to support the area of study. [1]		6
Dissertation		
NURS 898	Dissertation	12
Total Hours		58

[1]Of the six credits of methods courses and six credits of electives, a minimum of six credits must be taken in a discipline other than nursing. Electives must be approved by the student's adviser.

Total graduate credit hours required (minimum) 58

Comprehensive examination requirements

The purpose of the comprehensive examination is to test synthesis of foundational knowledge in preparation for launching a program of scholarship as a beginning scientist. Three knowledge domains are critical: a) theory and philosophy, b) qualitative and c) quantitative methodological approaches. The student's area of study is incorporated into these three domains. The comprehensive exam consists of two components, a written and an oral component, both of which must be passed. The oral exam will be conducted with the student either in person or via video conference.

Dissertation requirements

The student must conduct a substantial independent investigation and prepare a dissertation reporting the results of this research and analyzing its significance in relation to existing scientific knowledge. Satisfactory completion of the comprehensive examination and a satisfactory oral defense of the dissertation proposal are required prior to commencement of actual work outlined in the proposal. Once approved, the dissertation proposal is similar to a formal contract between the student and dissertation committee about the nature of the dissertation.

The dissertation committee must consist of a minimum of four members. A member of the graduate faculty of the School of Nursing who has an established program of research and prior experience on dissertation committees must chair a student's dissertation committee. Other committee members must include one faculty member from the student's focus area and one member from outside the School of Nursing. The dissertation committee is approved by the associate dean for academic programs in the School of Nursing. An oral defense of the dissertation is conducted by the student's dissertation committee. The student is responsible for preparing the dissertation in accordance with the most current version of the Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf).

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Program website: nursing.vcu.edu/programs/phd (http://nursing.vcu.edu/programs/phd)

Nursing, Master of Science (M.S.) with a concentration in adult-gerontology acute care nurse practitioner

The VCU School of Nursing adult-gerontology acute care nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to manage acutely ill adults, ranging from adolescents to the elderly, through all phases of their hospitalization. Students learn to manage patients through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures, and implementation of evidence-based treatment strategies. Graduates of the AGACNP concentration are prepared to diagnose and manage complex health problems of adults across the life span, including acute/critical illness and injuries, as well as exacerbations of chronic conditions.

The AGACNP generally works in an acute care setting, often within a multidisciplinary team focused on the provision of evidence-based care to adults who are acutely ill. The sphere of influence of the nurse practitioner is that of the patient.

Graduates of the AGACNP concentration are eligible to apply for certification as an AGACNP by the American Nurses Credentialing Center or the American Association of Critical-Care Nurses.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/masters)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a baccalaureate (or higher) graduate of an accredited (ACEN, CCNE or CNEA) nursing program
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Complete a minimum of three credit hours in statistics with a minimum grade of B
6. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

School of Nursing B.S. graduates who successfully completed the requirements of the VCU Honors College are eligible for guaranteed admission to the master's program or the post-B.S. to Ph.D. program upon submission of an application form and personal statement. Requirements for references are waived.

Degree requirements

Forty-nine graduate credit hours are required for the adult-gerontology acute care nurse practitioner concentration.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Master of Science in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Core courses

Course	Title	Hours
NURS 501	Advanced Professionalization I	1
NURS 502	Advanced Nursing Practice: Pharmacotherapeutics	3
NURS 503	Ethics, Advanced Nursing Practice and the Health Care Environment	3
NURS 504	Advanced Pathophysiology	3
NURS 507	Health Promotion and Disease Prevention Across the Lifespan	4
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 511	Health Assessment for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
NURS 601	Advanced Professionalization II	1
Total Hours		24

Concentration courses

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 612	Acute Care Advanced Practice Clinical Procedures	1
NURS 618	Diagnosis and Management in Adult-Gerontology Acute Care I	3
NURS 619	Diagnosis and Management in Adult-Gerontology Acute Care II	3
NURS 620	Gero-pharmacology	1
NURS 662	Diagnosis and Management in Adult-Gerontology Critical Care	4
NURS 678	Adult-Gerontology Acute Care Practicum I	3
NURS 669	Adult-Gerontology Acute Care Practicum II	4
NURS 679	Adult-Gerontology Acute Care Practicum III	5
Total Hours		25

Total graduate credit hours required (minimum) 49

Graduate program director
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Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/education/masters (http://www.nursing.vcu.edu/education/masters)

Nursing, Master of Science (M.S.) with a concentration in adult-gerontology primary care nurse practitioner

The VCU School of Nursing adult-gerontology primary care nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to diagnose and manage common acute and chronic health problems in adults, ranging from adolescents to the elderly. Students learn to manage patients through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures, and implementation of evidence-based treatment strategies, including health promotion and disease prevention.

The AGPCNP has a practice located in a variety of primary care settings, including college health services, health maintenance organizations, community clinics, long-term care, assisted living, continuing care retirement communities, occupational health settings and private practices.

Graduates of the AGPCNP concentration are eligible to apply for certification as an AGACNP by the American Nurses Credentialing Center or the American Association of Nurse Practitioners.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/masters)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a baccalaureate (or higher) graduate of an accredited (ACEN, CCNE or CNEA) nursing program
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Complete a minimum of three credit hours in statistics with a minimum grade of B
6. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

School of Nursing B.S. graduates who successfully completed the requirements of the VCU Honors College are eligible for guaranteed admission to the master's program or the post-B.S. to Ph.D. program upon submission of an application form and personal statement. Requirements for references are waived.

Degree requirements

Forty-eight graduate credit hours are required for the adult-gerontology primary care nurse practitioner concentration.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Master of Science in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Core courses

Course	Title	Hours
NURS 501	Advanced Professionalization I	1
NURS 502	Advanced Nursing Practice: Pharmacotherapeutics	3
NURS 503	Ethics, Advanced Nursing Practice and the Health Care Environment	3
NURS 504	Advanced Pathophysiology	3
NURS 507	Health Promotion and Disease Prevention Across the Lifespan	4
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 511	Health Assessment for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
NURS 601	Advanced Professionalization II	1
Total Hours		24

Concentration courses

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 615	Diagnosis and Management in Adult-Gerontology Primary Care I	3
NURS 616	Diagnosis and Management in Adult-Gerontology Primary Care II	3
NURS 617	Advanced Gerontology Primary Care Across the Care Continuum	4
NURS 620	Gero-pharmacology	1
NURS 676	Adult-Gerontology Primary Care Practicum I	3
NURS 675	Adult-Gerontology Primary Care Practicum II	4
NURS 677	Adult-Gerontology Primary Care Practicum III	5
Total Hours		24

Total graduate credit hours required (minimum) 48

Graduate program director
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Phone: (804) 827-0629

Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/education/masters (http://www.nursing.vcu.edu/education/masters)

Nursing, Master of Science (M.S.) with a concentration in family nurse practitioner

The VCU School of Nursing family nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills needed to diagnose and manage common acute and chronic health problems across the lifespan through comprehensive physical and psychosocial assessments, use of decision-making/diagnostic reasoning processes, performance of advanced practice skills and procedures and implementation of evidence-based treatment strategies, including health promotion and disease prevention.

The FNP is prepared to provide direct care to individuals and families in a variety of primary care settings, including college health services, health maintenance organizations, community clinics, long-term care, assisted living, continuing care retirement communities, occupational health settings, urgent care and private practices.

Graduates of the FNP concentration are eligible to apply for certification as a FNP by the American Nurses Credentialing Center or the American Academy of Nurse Practitioners.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the

graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/masters)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a baccalaureate (or higher) graduate of an accredited (ACEN, CCNE or CNEA) nursing program
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Complete a minimum of three credit hours in statistics with a minimum grade of B
6. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

School of Nursing B.S. graduates who successfully completed the requirements of the VCU Honors College are eligible for guaranteed admission to the master's program or the post-B.S. to Ph.D. program upon submission of an application form and personal statement. Requirements for references are waived.

Degree requirements

Fifty-one credit hours are required for the family nurse practitioner concentration.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Master of Science in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Core courses

Course	Title	Hours
NURS 501	Advanced Professionalization I	1
NURS 502	Advanced Nursing Practice: Pharmacotherapeutics	3

NURS 503	Ethics, Advanced Nursing Practice and the Health Care Environment	3
NURS 504	Advanced Pathophysiology	3
NURS 507	Health Promotion and Disease Prevention Across the Lifespan	4
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 511	Health Assessment for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
NURS 601	Advanced Professionalization II	1
Total Hours		24

Concentration courses

Course	Title	Hours
NURS 611	Primary Care Advanced Practice Clinical Procedures	1
NURS 627	Foundational Perspectives of Family-centered Care	2
NURS 629	Diagnosis and Management in Family Primary Care I	4
NURS 630	Diagnosis And Management In Family Primary Care II	4
NURS 631	Primary Care of Select Populations	2
NURS 643	Family Primary Care Practicum I	6
NURS 644	Family Primary Care Seminar	1
NURS 645	Family Primary Care Practicum II	6
NURS 646	Family Primary Care Final Synthesis Seminar	1
Total Hours		27

Total graduate credit hours required (minimum) 51

Graduate program director
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Phone: (804) 827-0629

Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/education/masters (http://www.nursing.vcu.edu/education/masters)

Nursing, Master of Science (M.S.) with a concentration in nursing administration and leadership

For students interested in a leadership role in a health care organization, the nursing administration and leadership concentration at the VCU School of Nursing offers a flexible and rewarding career path. Over the past three decades, this concentration has gained a reputation for educating some of the nation's top nursing leaders. With a vision of shaping the future of health care through innovative nursing leadership, the NAL concentration prepares nurses to play an essential systems-level role in promoting and sustaining high-quality and safe patient care. Students gain advanced knowledge and skills in the areas of leadership, administration, management, health care finance, budgeting, outcomes management and evidence-based organizational practices in health care.

Graduates of the NAL concentration are prepared to succeed in nursing leadership positions and are eligible, depending on employment role, to apply for several different nursing administration certification exams offered through the American Nurses Credentialing Center of the American Nurses Association or the American Organization of Nurse Executives.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin

and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/masters)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	March 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a baccalaureate (or higher) graduate of an accredited (ACEN, CCNE or CNEA) nursing program
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Complete a minimum of three credit hours in statistics with a minimum grade of B
6. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

School of Nursing B.S. graduates who successfully completed the requirements of the VCU Honors College are eligible for guaranteed admission to the master's program or the post-B.S. to Ph.D. program upon submission of an application form and personal statement. Requirements for references are waived.

Degree requirements

Forty-one graduate credit hours are required for the nurse administration and leadership concentration.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Master of Science in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Course	Title	Hours
Core courses		
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3
Concentration courses		
NURS 609	Health Care Delivery and Reimbursement Systems for Nurse Leaders	3
NURS 613	Organizational Behavior and Leadership for Nurse Leaders	3
NURS 614	Organizational Systems and Leadership for Nurse Leaders	3

NURS 639	Health Informatics for Nurse Leaders	3
NURS 651	Decision Analysis for Quality Outcomes Across Populations	3
NURS 652	Health Care Managerial Finance I: For Nurse Leaders	3
NURS 653	Health Care Managerial Finance II: Economic Evaluation and Analysis	3
NURS 666	Strategic and Change Management for Quality Outcomes for Nurse Leaders	2
NURS 668	Human Resource and Customer Relationship Management for Nurse Leaders	3
NURS 695	Managing for Performance and Health Care Outcomes	3
NURS 696	Practicum I: Comparative Health Care Delivery Systems for Nurse Leaders	2
NURS 697	Practicum II: Comparative Interdisciplinary Health Care Leadership Roles	1
NURS 698	Practicum III: Applied Integrative Health Care Delivery Leadership	3
Total Hours		41

Total graduate credit hours required (minimum) 41

Graduate program director
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Phone: (804) 827-0629

Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/education/masters (http://www.nursing.vcu.edu/education/masters)

Nursing, Master of Science (M.S.) with a concentration in psychiatric-mental health nurse practitioner

The psychiatric-mental health nurse practitioner concentration prepares graduates for advanced practice registered nurse roles by developing the knowledge and skills in areas of mental health promotion, as well as mental illness prevention, assessment, diagnosis, treatment and patient education in the care of individuals across the lifespan. Students are exposed to a unique balance of neuroscience, psychological theory and evidence-based practice. Students crystalize their understanding of this content through the use of simulation, interactive case study, discussion board activity, individual and group-based projects, writing assignments, testing and supervised practicum experiences. Informed by a balanced approach to care, students receive focused instruction in both psychotherapy and psychopharmacotherapy.

The PMHNP is prepared to assess, diagnose, treat and educate individuals, families and groups with complex psychiatric-mental health problems and do so with an interprofessional lens of quality and safety. PMHNPs work in clinical settings that include private, state or Veterans Affairs in-patient or outpatient psychiatric facilities, private psychiatric practices, and community mental health centers. PMHMPs also provide services in settings such as correctional facilities, domestic violence shelters, residential substance abuse facilities and schools.

Graduates of the PMHNP concentration are eligible to apply for the Psychiatric and Mental Health Nurse Practitioner certification exam administered by the American Nurses Credentialing Center.

Program goals

Graduates will achieve advanced nursing practice competencies by demonstrating:

1. Systems and organizational leadership
2. Implementation of advanced nursing practice interventions
3. Effective use of research and technology
4. Systematic evaluation of interventions and outcomes

Student learning outcomes

Graduates will be able to:

1. Demonstrate core competencies in their advanced practice specialties
2. Integrate nursing and related sciences into the delivery of advanced nursing care to diverse populations and systems of health care delivery
3. Apply ethical analysis and clinical reasoning to assess, intervene and evaluate advanced nursing care delivery
4. Understand the implications of social, cultural, economic, policy and organizational systems that impact practice and outcomes
5. Synthesize evidence for practice to determine appropriate application of interventions across diverse populations and settings
6. Use quality processes and improvement science to evaluate care and ensure patient safety for individuals, populations and systems
7. Integrate organizational science and technology to make changes in the care environment to improve health outcomes and practice efficiency

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

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Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

VCU School of Nursing Student Policy and Information handbooks (http://nursing.vcu.edu/about-us/resources) are located on the school's website.

Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/masters)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Mar 15	

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be eligible for readmission or in good standing at the last college attended
3. Be a baccalaureate (or higher) graduate of an accredited (ACEN, CCNE or CNEA) nursing program
4. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
5. Complete a minimum of three credit hours in statistics with a minimum grade of B
6. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university

School of Nursing B.S. graduates who successfully completed the requirements of the VCU Honors College are eligible for guaranteed admission to the master's program or the post-B.S. to Ph.D. program upon submission of an application form and personal statement. Requirements for references are waived.

Degree requirements

Forty-seven graduate credit hours are required for the psychiatric-mental health nurse practitioner concentration.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the degree of Master of Science in Nursing must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work or thesis study

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Core courses

Course	Title	Hours
NURS 501	Advanced Professionalization I	1
NURS 502	Advanced Nursing Practice: Pharmacotherapeutics	3
NURS 503	Ethics, Advanced Nursing Practice and the Health Care Environment	3
NURS 504	Advanced Pathophysiology	3
NURS 507	Health Promotion and Disease Prevention Across the Lifespan	4
NURS 508	Policy, Processes and Systems for Advanced Nursing Practice	3
NURS 511	Health Assessment for Advanced Nursing Practice	3
NURS 512	Evidence-Based Advanced Nursing Practice	3

NURS 601	Advanced Professionalization II	1
Total Hours		24

Concentration courses

Course	Title	Hours
NURS 635	Advanced Practice Psychiatric Mental Health Nursing Practicum I	6
NURS 636	Advanced Practice Psychiatric Mental Health Nursing Seminar	3
NURS 637	Advanced Practice Psychiatric Mental Health Nursing Practicum II	6
NURS 656	Diagnosis and Management of Psychiatric Disorders Across the Lifespan	4
NURS 657	Advanced Practice Psychiatric Mental Health Nursing: Theory and Practice Across the Lifespan	4
Total Hours		23

Total graduate credit hours required (minimum) 47

Graduate program director
Carla Nye, D.N.P., RN, CPNP-PC, CNE
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Phone: (804) 827-0629

Additional contact
Jeannetta Hollins, Ph.D.
Director, Office of Student Success
Email: vcu_nurse@vcu.edu

Program website: nursing.vcu.edu/education/masters (http://www.nursing.vcu.edu/education/masters)

Nursing Practice, Doctor of (D.N.P.)

Building on the strength of the Magnet-designated VCU Health System and the School of Nursing's Langston Center for Quality, Safety and Innovation, this program is strongly positioned to prepare students to improve the quality of health care delivery and patient outcomes. The Institute of Medicine's 2011 report "The Future of Nursing: Leading Change, Advancing Health" noted that nurses have a critical role in transforming today's increasingly complex health care system and called for increased education to provide nurses with key knowledge and skills to expand their influence. In order to meet this charge, graduates of the D.N.P. program at VCU will be prepared to improve health care delivery by critically appraising scientific evidence to inform practice, sharing clinical expertise in collaborative and dynamic environments, leading interprofessional teams, providing systems leadership for sustainable best practices in clinical settings and influencing health policy.

Further, graduates of VCU's School of Nursing D.N.P. program will be prepared to engage in evidence-based, clinically focused scholarship. With support from the Langston Center, students will design, implement and evaluate innovative projects that advance quality and safety science.

Designed to accommodate master's-prepared nurses already established in advanced practice registered nurse or nurse executive positions, the D.N.P. program is planned as a post-master's degree requiring completion of a minimum of 39 credits. While the traditional plan of study follows an eight-semester format, an accelerated option is also available. The program will employ an online format with students coming to campus three times per year.

The D.N.P. offers is a solution-focused program designed to prepare nurses to lead interprofessional efforts to develop patient quality and safety innovations, influence policy change in the transformation of health care systems and ensure ethical stewardship in practice. The program seeks to foster and broaden inquiry that sparks new insights as students make connections across disciplines to improve health care and its delivery. Building on the university's mission to improve human health, VCU D.N.P. graduates will translate evidence that leads to sustainable practice change for improved patient quality and safety outcomes.

Program goals

Students will achieve D.N.P.-level competencies by demonstrating:

1. Use of quality and safety outcomes to evaluate practice improvement initiatives
2. Skills in using evidence-based practice to achieve sustainable practice change
3. Advanced decision-making skills founded in ethics and the highest level of nursing practice
4. Leadership strategies to influence health policies
5. Interprofessional collaboration in health care systems

Student learning outcomes

At the completion of the D.N.P. program, students will have the knowledge and skills to:

1. Demonstrate strategic management skills in systems-based care delivery models and approaches designed to promote quality, safety and excellence in nursing practice
2. Assume a leadership role in the development, implementation and evaluation of health policies that improve quality and safety in health care systems
3. Translate and disseminate evidence-based practices to improve health care outcomes and reduce disparities
4. Integrate professional intra- and interdisciplinary best practices to create collaborative sustainable practice change
5. Integrate knowledge of specialized nursing practice with knowledge from other sciences as the basis for the highest level of nursing practice
6. Lead efforts to preserve, promote and improve the health of specialty populations
7. Use health information technology to promote best practices in health care systems
8. Ensure fiscal accountability when planning practice initiatives that will improve the quality of care delivery
9. Demonstrate advanced levels of ethical and moral judgment and decision-making

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Other information

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Our international and non-native English-speaking students bring different perspectives and new thinking to our nursing programs. To ensure that all incoming student are prepared for the school's academic rigor, all international applicants and non-native English speaking applicants without a degree from a U.S. high school, college or university must provide additional information with their applications according to the English language proficiency guidelines on the program admission tab.

Visit the School of Nursing website for program-specific application instructions (http://nursing.vcu.edu/admission/application-instructions/dnp)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
D.N.P.	Fall	Feb 1	

Note: A personal interview is required.

To be considered for admission to the School of Nursing, applicants must:

1. Meet the general admission requirements of the VCU Graduate School (p. 34)
2. Be a graduate of an accredited (ACEN, CCNE or CNEA) master's degree nursing program
3. Have a current unrestricted R.N. license or authorization to practice as an R.N. in the U.S.
4. Have a current certification in an advanced practice specialty (NP, CNS or nursing administration certification) by the time of entry into the program
5. Provide additional information with the application according to the English language proficiency guidelines in the VCU Bulletin for applicants who are international or non-native English speakers without a degree from a U.S. high school, college or university
6. Complete a personal interview

Degree requirements

A minimum of 39 graduate credit hours are required for the Doctor of Nursing Practice program.

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the D.N.P. degree must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all requirements for the prescribed curriculum within six calendar years of the first registration for work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all nursing courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to School of Nursing policies in respect to pass/fail grading for course work and D.N.P. project

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the dean and permission is granted.

Curriculum requirements

Course	Title	Hours
NURS 605	Statistical Methods for Quality Improvement	3
NURS 606	Evaluating Evidence to Improve Health Outcomes	3
NURS 607	Epidemiology and Population Health	3
NURS 608	Quality Improvement in Practice	3
NURS 610	Health Information and Emerging Health Care Technologies	3

NURS 621	Leadership and Organizational Systems	3
NURS 638	Health Policy Leadership and Advocacy	3
NURS 664	DNP Residency: Mentored Practicum	12
NURS 665	DNP Project I: Proposal Development	3
Elective chosen with adviser approval		3
Total Hours		39

Total graduate credit hours required (minimum) 39

Practice hours/residency requirement

National accreditation requirements dictate completion of 500 practice hours for all post-master's D.N.P. programs. These hours are structured into the curriculum via 12 credits of residency courses. At the post-master's D.N.P. level, practice hours focus on developing the skills needed to lead efforts to improve care outcomes rather than direct clinical practice skills, as is the focus at the master's level. Experiences will be varied depending upon the student's abilities in relation to the D.N.P. essential competencies. For example, students may work with the quality improvement team in a particular setting to develop and implement an improvement initiative; they may develop an evidence-based practice guideline for a patient problem; or they may develop a policy change initiative in concert with their professional association. Practice experiences, settings and the focus of residency hours are individualized and developed mutually by the student and faculty adviser. Each residency course has individualized objectives, assignments and products that demonstrate student achievement of specific D.N.P. essential competencies. Qualified preceptors, based on their expertise and experience, will be identified to provide supervision as needed to support particular practice experiences. Students, preceptors and faculty advisers will all contribute to evaluation of student success in meeting the identified objectives developed for each residency course; final evaluation of all residency requirements is the responsibility of the faculty adviser for the course. Residency courses are graded on a pass-fail basis. The school has identified criteria that will trigger an adviser's decision to travel to the site for direct observation, such as preceptor concerns regarding student performance or unsatisfactory communications with student or preceptor that cannot be resolved by telephone or video conference. The completed assignments from each residency course culminate in a professional portfolio that demonstrates achievement of all residency course objectives by the completion of the 12 required residency credits.

Project requirements

The D.N.P. program culminates in the successful completion of a scholarly work called the D.N.P. project. In collaboration with their faculty adviser and project team, students design, implement and evaluate a quality/safety project that is focused in their specialized clinical area. The final product is a scholarly manuscript describing the project that is suitable for publication in a professional journal. The manuscript provides evidence of the student's critical thinking and ability to translate research and best evidence through problem identification, proposal development, implementation and evaluation. The project will be overseen by the student's adviser and a D.N.P. project team composed of the adviser and two doctorally prepared content experts selected by the student in consultation with the adviser. One member must be from the practice setting where the student conducts the project. The curriculum is designed so that students begin planning their D.N.P. project during initial course work and complete the project in their final semester of study. Two project courses, NURS 665 and NURS 667, are built into the curriculum in the final two semesters of study. Each course is graded pass-fail — the D.N.P. project adviser serves as the faculty member of record for each course. Students will develop a proposal and have it approved (including by the VCU Institutional Review Board, if required) during the first course, and implement the project in the second course. Students defend the written project in an oral presentation to their D.N.P. project team at the end of the final course, and each team member votes to approve or disapprove the project. In the event of two or more negative votes, the D.N.P. project team will make recommendations for revisions or additional course work and will specify a timeline for completion of the revised project. Students will be given a second opportunity to successfully complete the oral formal review. In the event of two failures, the student will be dismissed from the program.

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SCHOOL OF PHARMACY

The School of Pharmacy was established officially in 1898; the University College of Medicine had a school of pharmacy when it opened in 1893. The two-year curriculum gave way to a three-year program in 1925, and in 1932 the school required four years of college work and a Bachelor of Science degree was awarded. In 1960, the program lengthened to a five-year course leading to a Bachelor of Science in Pharmacy degree. In 1975, authority was granted to offer to selected students a six-year program leading to the Doctor of Pharmacy degree and this program was adopted as the only professional offering by the school in 1995. The School of Pharmacy currently enrolls students in a four-year professional Doctor of Pharmacy program curriculum following completion of at least 73 credits of pre-professional studies taken at VCU or elsewhere. In 1996 a part-time program was offered that permitted current Bachelor of Science in Pharmacy degree holders to earn the Doctor of Pharmacy degree in a nontraditional format requiring students to come to campus infrequently. This program was phased out in 2015 and no longer accepts students for enrollment. Since 1971, all pharmacy students have participated in a clerkship program (now referred to as advanced pharmacy practice experiences) during the final year of the curriculum. Beginning 2008, the school added introductory pharmacy practice experiences during the first three years of the program to gradually transition the student from the academic classroom setting into the practice arena. Students spend their final year in a variety of practice settings under the supervision of highly qualified faculty preceptors.

The authority to award graduate degrees in the pharmaceutical sciences was granted by the Graduate Council in 1952. Departments in the school have the responsibility for administering a graduate program leading to the M.S. and Ph.D. in Pharmaceutical Sciences. This program includes areas of specialization in medicinal chemistry, pharmaceutics, pharmacotherapy and pharmacy administration. These programs provide the preparation and research experience for academic, governmental and industrial careers. Graduate degrees in pharmaceutical sciences do not provide eligibility for licensure as a pharmacist.

Administration

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Dean

Cynthia K. Kirkwood, Pharm.D., BCPP
Executive associate dean for academic affairs

Kelechi C. Ogbonna, Pharm.D., M.S.H.A., BCGP
Associate dean for admissions and student services

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies

Phylliss M. Moret
Assistant dean for experiential education

Victoria Savoy
Assistant dean for finance and administration

Michael J. Clarke, Pharm.D.
Assistant dean for INOVA Campus

Rafael Saenz, Pharm.D.
Assistant dean for UVa campus

Veronica P. Shuford
Director of educational innovation and assessment

Ellen Carfagno
Director of development

Brian A. Canaday
Director of academic technology

Statement of purpose

The School of Pharmacy at VCU exists to provide exceptional programs benefiting the commonwealth of Virginia and society by offering the highest quality education and training for the development of health care practitioners, scientists, professional leaders and responsible citizens. These individuals are committed to shaping the health care world of tomorrow while serving society's health care needs today.

Mission statement

Mission

To achieve excellence in professional and graduate programs through innovative education and leading-edge research. We will achieve our mission by graduating outstanding future pharmacists and scientists who will improve human health, foster exemplary research and provide sustaining contributions to interprofessional patient care.

Vision

A transformational leader in pharmacy education, clinical practice and clinical and pharmaceutical research.

Core values

1. **Innovation**
   We encourage innovations and ideas that enhance the school's mission.
2. **Personal growth**
   We pursue professional growth and personal development that drives excellence.
3. **Integrity and respect**
   We demonstrate ethical behaviors, personal responsibility and respect for others.
4. **Collaboration**
   We embrace interprofessional and interdisciplinary collaboration in patient care, teaching, learning and research.
5. **Inclusive excellence**
   We promote an environment of engagement and inclusion that values the diversity and contributions of our students, staff, faculty and administrators.

Philosophy

The School of Pharmacy has committed to developing progressive models of pharmacy practice while maintaining the foundational

pharmaceutical sciences. In developing the curriculum of the school, the faculty recognizes that an educated person should be prepared to assume a responsible and rewarding role in society. The new paradigm of patient-centered, team-based care guides the school's curriculum committee and faculty in the design and implementation of the Doctor of Pharmacy curriculum. The curriculum is designed to provide a sound, scientific and professional background for both those who will enter the practice of pharmacy directly and those who wish to continue graduate education in the pharmaceutical sciences. It also includes courses in the arts and humanities in order to provide students with a broad educational base that will permit participation in community life, not only as a professional, but also as an informed, concerned citizen. The professional curriculum is rigorous and highly demanding of the student's time. The faculty has adopted educational outcomes for the curriculum that describe the knowledge, skills, behaviors, abilities and attitudes that promote holistic patient well-being expected of graduates to deliver the highest quality of direct patient care as an interprofessional team member.

Facilities

The School of Pharmacy is located in the Robert Blackwell Smith Building at 12th and East Clay streets. This building — named in honor of a distinguished former dean of pharmacy, former president of the Medical College of Virginia and former provost of the MCV Campus — was completed in 1984 with the help of contributions from many alumni and friends of the School of Pharmacy. Additional classrooms, offices and laboratories are located in McGuire Hall and the Virginia BioTechnology Research Park, both located within a few blocks of the Smith Building.

Classes for students in pharmacy also are conducted in Sanger Hall, located between 11th and 12th streets on East Marshall Street, and McGuire Hall, located at the corner of 12th and Clay streets. In conjunction with VCU Health, students receive clinical experience in the hospitals and clinics on the MCV Campus. Other facilities available for teaching include area hospitals and pharmacies. The major library holdings are in the Tompkins-McCaw Library for the Health Sciences at 12th and East Clay streets.

Location in a major health sciences center provides excellent opportunities for interdisciplinary research and access to clinical facilities. The school is well equipped for graduate research and provides leadership to the VCU Institute for Structural Biology, Drug Discovery and Development at the Virginia BioTechnology Research Park. The school also supports the Center for Compounding Practice and Research, the Center for Biomarker Research and Precision Medicine, and the Center for Pharmacy Practice Innovation.

Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) with a concentration in medicinal chemistry

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the doctoral level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
Website for current students:
pharmacy.vcu.edu/programs/graduate/current-students (http://www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:
pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	Jan 1	GRE, TOEFL (international applicants)

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area, demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), Ph.D. students in pharmaceutical sciences must complete a minimum of 30 graduate credit hours beyond the master's degree of required (both school and department core) and elective hours. All Ph.D. students must pass the comprehensive exam in each department in order to advance to candidacy. The exam consists of a written and oral component and is administered by either the student advisory committee (oral and written) and/or department faculty (written), depending on which option the student chooses. All Ph.D. students must pass the dissertation review and defense in each department in order to graduate.

All School of Pharmacy graduate students must fulfill curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. Course work taken as part of a master's degree program may be waived; however, students must replace those courses with additional course work or directed research to meet the minimum 30 credit hour requirement for the Ph.D.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
CHEM 504	Advanced Organic Chemistry I	3
MEDC 526	Research Techniques in Medicinal Chemistry	1-4
MEDC 541	Survey of Molecular Modeling Methods	1-3
or CHEM 510	Atomic and Molecular Structure	
MEDC 591	Special Topics in Medicinal Chemistry	1-3.5
MEDC 601	Advanced Medicinal Chemistry I	2

Electives

Course	Title	Hours
Select a minimum of 12 elective credit hours (recommended for the Ph.D.) [1]		12

[1]

The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student. These electives may include courses outside the department.

Research

Students are required to complete a dissertation. The 30 credit-hour minimum directed research requirement may be waived for

circumstances such as a prior M.S. degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Take a minimum of 30 credits in the following:		30
MEDC 697	Directed Research in Medicinal Chemistry (variable credit)	
Total Hours		30

Total graduate credit hours required (minimum) 60

Graduate program director
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Associate dean for research and graduate studies
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Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) with a concentration in pharmaceutics

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the doctoral level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
Website for current students:
pharmacy.vcu.edu/programs/graduate/current-students (http://www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:

pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), Ph.D. students in pharmaceutical sciences must complete a minimum of 30 graduate credit hours beyond the master's degree of required (both school and department core) and elective hours. All Ph.D. students must pass the comprehensive exam in each department in order to advance to candidacy. The exam consists of a written and oral component and is administered by either the student advisory committee (oral and written) and/or department faculty (written), depending on which option the student chooses. All Ph.D. students must pass the dissertation review and defense in each department in order to graduate.

All School of Pharmacy graduate students must fulfill curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. Course work taken as part of a master's degree program may be waived; however, students must replace those courses with additional course work or directed research to meet the minimum 30 credit hour requirement for the Ph.D.

Curriculum requirements

Prerequisites

All students should have prerequisite knowledge in chemistry, mathematics and biology. The following departmental courses or their equivalents are required for admission into the Department of Pharmaceutics option. If a prospective student has not met any of the prerequisites, the course(s) may be included in the student's core course requirements upon recommendation by the prospective graduate adviser and approval by the respective course coordinator (see below).

Course	Title	Hours
CHEM 409 & CHEZ 409	Instrumental Analysis and Instrumental Analysis Laboratory [1]	5
PCEU 508	Pharmacokinetics	3
PCEU 509	Pharmaceutics and Biopharmaceutics II	3

[1]

Undergraduate prerequisite course work may not count toward the minimum 30 graduate credit hours required for the degree and may not be included in the calculation of graduate statistics, i.e., GPA, 20 percent C or below rule, etc.

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/ PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2
Total Hours		9

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
PCEU 612	Advanced Physical Pharmacy and Biopharmaceutics	3
PCEU 625	Pharmaceutical Analysis	2
PCEU 690	Pharmaceutics Research Seminar	1
Total Hours		9

Electives

Course	Title	Hours
Electives (see details below)		12

In addition to the core curriculum above, Ph.D. students will be encouraged but not required to take elective courses. A minimum 12

elective credit hours are recommended for the Ph.D. These courses will be selected based upon individual research program needs and will be chosen through mutual consultation with the student and major adviser.

Research
Students are required to complete a dissertation. The 30 credit-hour minimum directed research requirement may be waived for circumstances such as a prior M.S. degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Take a minimum of 30 credits in the following:		30
PCEU 697	Directed Research in Pharmaceutics (variable credit)	

Total graduate credit hours required (minimum) 60

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) with a concentration in pharmacoeconomics and health outcomes

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the doctoral level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Other information

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), Ph.D. students in pharmaceutical sciences must complete a minimum of 30 graduate credit hours beyond the master's degree of required (both school and department core) and elective hours. All Ph.D. students must pass the comprehensive exam in each department in order to advance to candidacy. The exam consists of a written and oral component and is administered by either the student advisory committee (oral and written) and/or department faculty (written), depending on which option the student chooses. All Ph.D. students must pass the dissertation review and defense in each department in order to graduate.

All School of Pharmacy graduate students must fulfill curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. Course work taken as part of a master's degree program may be waived; however, students must replace those courses with additional course work or directed research to meet the minimum 30 credit hour requirement for the Ph.D.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II (or equivalent)	3
or STAT 544	Statistical Methods II	
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3
PHAR 638	Pharmaceutical Benefit Management	3
PHAR 671	Applied Pharmacoeconomics and Outcomes Research	3
Total Hours		12

Electives

Course	Title	Hours
Electives (see details below)		12

In addition to the core curriculum above, Ph.D. students in pharmacoeconomics and health outcomes will typically be requested to take elective courses that exceed 24 credit hours in an area of concentration. A minimum 12 elective credit hours are recommended for the Ph.D. These courses will be selected based upon the mutual consent of the student and major adviser.

Research

Students are required to complete a dissertation. The 30 credit-hour minimum directed research requirement may be waived for circumstances such as a prior M.S. degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Take a minimum of 30 credits in the following course:		30
PHAR 697	Directed Research in Pharmacy (variable credit)	
Total Hours		30

Total graduate credit hours required (minimum) 60

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) with a concentration in pharmacotherapy

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the doctoral level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to

perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), Ph.D. students in pharmaceutical sciences must complete a minimum of 30 graduate credit hours beyond the master's degree of required (both school and department core) and elective hours. All Ph.D. students must pass the comprehensive exam in each department in order to advance to candidacy. The exam consists of a written and oral component and is administered by either the student advisory committee (oral and written) and/or department faculty (written), depending on which option the student chooses. All Ph.D. students must pass the dissertation review and defense in each department in order to graduate.

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Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/ PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II (or equivalent)	3
or STAT 544	Statistical Methods II	
PHAR 626	Advanced Pharmacotherapy Research Methods	3
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3
Total Hours		9

Electives

Course	Title	Hours
Electives (see details below)		12

In addition to the core curriculum above, a minimum 12 elective credit hours are recommended for the Ph.D. These courses will be selected based upon the mutual consent of the student and major adviser.

Research

Students are required to complete a dissertation. The 30 credit-hour minimum directed research requirement may be waived for circumstances such as a prior M.S. degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Take a minimum of 30 credits in the following course:		30
PHAR 697	Directed Research in Pharmacy (variable credit)	
Total Hours		30

Total graduate credit hours required (minimum) 60

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of (M.P.S.) with a concentration in medicinal chemistry

Program goal

The School of Pharmacy offers the highest quality of teaching in the pharmaceutical sciences graduate program at the Master of Pharmaceutical Sciences level. The M.P.S. is a non-thesis degree.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   Candidates should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of their areas of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their fields.
2. **Design experiments in pharmaceutical sciences**

Candidates should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to their research.

3. **Demonstrate appropriate communication skills**
   Candidates should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Other information

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.S.	Fall	Jan 1	GRE, TOEFL (international applicants)

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a Doctor of Pharmacy (Pharm.D.) or a bachelor's degree in a related area from an accredited college or university.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), all School of Pharmacy graduate students must fulfill the curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. In order to graduate, M.P.S. students must complete a minimum of 30 graduate credit hours of required and elective course work and must pass the project review and defense in each department.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1

PCEU 690	Pharmaceutics Research Seminar (variable credit)	
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PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
CHEM 504	Advanced Organic Chemistry I	3
MEDC 526	Research Techniques in Medicinal Chemistry	1-4
MEDC 541	Survey of Molecular Modeling Methods	1-3
or CHEM 510	Atomic and Molecular Structure	
MEDC 591	Special Topics in Medicinal Chemistry	1-3.5
MEDC 601	Advanced Medicinal Chemistry I	2

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.P.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student. Electives may include courses outside the department.

Research

Students are required to complete a project. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
Select a minimum of six credits from the following:		6
PHAR 697	Directed Research in Pharmacy (variable credit)	
MEDC 697	Directed Research in Medicinal Chemistry (variable credit)	
PCEU 697	Directed Research in Pharmaceutics (variable credit)	

Total graduate credit hours required (minimum) 30

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
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Additional contact
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Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of (M.P.S.) with a concentration in pharmaceutics

Program goal

The School of Pharmacy offers the highest quality of teaching in the pharmaceutical sciences graduate program at the Master of Pharmaceutical Sciences level. The M.P.S. is a non-thesis degree.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   Candidates should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of their areas of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their fields.
2. **Design experiments in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to their research.
3. **Demonstrate appropriate communication skills**
   Candidates should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

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continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

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Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

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pharmacy.vcu.edu/programs/graduate/current-students (http://www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:
pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), all School of Pharmacy graduate students must fulfill the curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. In order to graduate, M.P.S. students must complete a minimum of 30 graduate credit hours of required and elective course work and must pass the project review and defense in each department.

Prerequisites

All students should have prerequisite knowledge in chemistry, mathematics and biology. The following departmental courses or their equivalents are required for admission into the Department of Pharmaceutics option. If a prospective student has not met any of the prerequisites, the course(s) may be included in the student's core course requirements upon recommendation by the prospective graduate adviser and approval by the respective course coordinator (see below).

Course	Title	Hours
CHEM 409 & CHEZ 409	Instrumental Analysis and Instrumental Analysis Laboratory [1]	5
PCEU 507	Pharmaceutics and Biopharmaceutics I (except pharmaceutical calculus)	3
PCEU 508	Pharmacokinetics	3
PCEU 509	Pharmaceutics and Biopharmaceutics II	3

[1]

Undergraduate prerequisite course work may not count toward the minimum 30 graduate credit hours required for the degree and may not be included in the calculation of graduate statistics, i.e., GPA, 20 percent C or below rule, etc.

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	

PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
PCEU 612	Advanced Physical Pharmacy and Biopharmaceutics	3
PCEU 625	Pharmaceutical Analysis	2
PCEU 690	Pharmaceutics Research Seminar	1
Total Hours		9

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.P.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student. These electives may include courses outside the department.

Research

Students are required to complete a project. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PCEU 697	Directed Research in Pharmaceutics (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of (M.P.S.) with a concentration in pharmacoeconomics and health outcomes

Program goal

The School of Pharmacy offers the highest quality of teaching in the pharmaceutical sciences graduate program at the Master of Pharmaceutical Sciences level. The M.P.S. is a non-thesis degree.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   Candidates should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of their areas of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their fields.
2. **Design experiments in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to their research.
3. **Demonstrate appropriate communication skills**
   Candidates should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's

faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
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Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), all School of Pharmacy graduate students must fulfill the curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. In order to graduate, M.P.S. students must complete a minimum of 30 graduate credit hours of required and elective course work and must pass the project review and defense in each department.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II	3
or STAT 544	Statistical Methods II	
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3
PHAR 638	Pharmaceutical Benefit Management	3
PHAR 671	Applied Pharmacoeconomics and Outcomes Research	3
Total Hours		12

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.P.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student.

Research
Students are required to complete a project. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PHAR 697	Directed Research in Pharmacy (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of (M.P.S.) with a concentration in pharmacotherapy

Program goal

The School of Pharmacy offers the highest quality of teaching in the pharmaceutical sciences graduate program at the Master of Pharmaceutical Sciences level. The M.P.S. is a non-thesis degree.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   Candidates should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of their areas of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their fields.
2. **Design experiments in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to their research.
3. **Demonstrate appropriate communication skills**
   Candidates should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   Candidates should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
Website for current students:
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Website for prospective students:

pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), all School of Pharmacy graduate students must fulfill the curricular requirements of the School of Pharmacy core curriculum and the core curriculum required by their respective options. In order to graduate, M.P.S. students must complete a minimum of 30 graduate credit hours of required and elective course work and must pass the project review and defense in each department.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II (or equivalent)	3
or STAT 544	Statistical Methods II	
PHAR 626	Advanced Pharmacotherapy Research Methods	3
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3
Total Hours		9

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is required for the M.P.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student.

Research

Students are required to complete a project. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PHAR 697	Directed Research in Pharmacy (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of Science (M.S.) with a concentration in medicinal chemistry

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the Master of Science level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jan 1	GRE, TOEFL (international applicants)

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area, demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), M.S. students in pharmaceutical sciences must complete a minimum of 30 didactic credit hours of required (both school and department core) and elective hours. All M.S. students must pass the

thesis review and defense in each department in order to advance to graduate.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/ PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
CHEM 504	Advanced Organic Chemistry I	3
MEDC 526	Research Techniques in Medicinal Chemistry	1-4
MEDC 541	Survey of Molecular Modeling Methods	1-3
or CHEM 510	Atomic and Molecular Structure	
MEDC 591	Special Topics in Medicinal Chemistry	1-3.5
MEDC 601	Advanced Medicinal Chemistry I	2

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student. These electives may include courses outside the department.

Research

Students are required to complete a thesis. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
MEDC 697	Directed Research in Medicinal Chemistry (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of Science (M.S.) with a concentration in pharmaceutics

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the Master of Science level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

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Degree candidacy requirements

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Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

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Other information

School of Pharmacy policies and procedures for graduate students
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Apply online atgraduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), M.S. students in pharmaceutical sciences must complete a minimum of 30 didactic credit hours of required (both school and department core) and elective hours. All M.S. students must pass the thesis review and defense in each department in order to advance to graduate.

Curriculum requirements

Prerequisites

All students should have prerequisite knowledge in chemistry, mathematics and biology. The following departmental courses or their equivalents are required for admission into the Department of Pharmaceutics option. If a prospective student has not met any of the prerequisites, the course(s) may be included in the student's core course requirements upon recommendation by the prospective graduate adviser and approval by the respective course coordinator (see below).

Course	Title	Hours
CHEM 409 & CHEZ 409	Instrumental Analysis and Instrumental Analysis Laboratory [1]	5
PCEU 507	Pharmaceutics and Biopharmaceutics I (except pharmaceutical calculus)	3
PCEU 508	Pharmacokinetics	3
PCEU 509	Pharmaceutics and Biopharmaceutics II	3

[1]

Undergraduate prerequisite course work may not count toward the minimum 30 graduate credit hours required for the degree and may not be included in the calculation of graduate statistics, i.e., GPA, 20 percent C or below rule, etc.

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	

MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/ PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2
Total Hours		9

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
PCEU 612	Advanced Physical Pharmacy and Biopharmaceutics	3
PCEU 625	Pharmaceutical Analysis	2
PCEU 690	Pharmaceutics Research Seminar	1
Total Hours		9

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.S. These courses will be selected based upon individual research program needs and will be chosen through mutual consultation with the student and major adviser.

Research

Students are required to complete a thesis. The six credit-hour minimum may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PCEU 697	Directed Research in Pharmaceutics (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of Science (M.S.) with a concentration in pharmacoeconomics and health outcomes

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the Master of Science level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
3. **Demonstrate appropriate communication skills**
   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin

and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
Website for current students:
pharmacy.vcu.edu/programs/graduate/current-students (http://www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:
pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have received a baccalaureate from an accredited institution in a related area demonstrating the ability to perform at the graduate level. Prerequisite and foundation course work may be required, depending upon the applicant's discipline.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), M.S. students in pharmaceutical sciences must complete a minimum of 30 didactic credit hours of required (both school and department core) and elective hours. All M.S. students must pass the thesis review and defense in each department in order to advance to graduate.

Curriculum requirements

School of Pharmacy core curriculum

Course	Title	Hours
Select one of the following:		3
BIOS 543	Graduate Research Methods I	
or STAT 543	Statistical Methods I	
MEDC 541	Survey of Molecular Modeling Methods (1 credit repeated)	
MEDC 601	Advanced Medicinal Chemistry I (1 credit repeated)	
IBMS 600	Laboratory Safety (or equivalent)	1
OVPR 601	Scientific Integrity (or equivalent)	1
Select a minimum of one credit from the following:		1
PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II (or equivalent)	3
or STAT 544	Statistical Methods II	
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3

PHAR 638	Pharmaceutical Benefit Management	3
PHAR 671	Applied Pharmacoeconomics and Outcomes Research	3
Total Hours		12

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student.

Research

Students are required to complete a thesis. The six credit-hour minimum directed research requirement may be waived for circumstances such as a prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PHAR 697	Directed Research in Pharmacy (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director

Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact

Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmaceutical Sciences, Master of Science (M.S.) with a concentration in pharmacotherapy

Program goal

The School of Pharmacy offers the highest quality of graduate training in pharmaceutical sciences research and mentorship at the Master of Science level.

Student learning outcomes

1. **Knowledge of research in pharmaceutical sciences**
   The candidate should demonstrate a general knowledge of the elements of the pharmaceutical sciences and a detailed knowledge of his/her area of research, including an appropriate familiarity with the research literature, policies and procedures, and methodology pertaining to their field.
2. **Design experiments in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the design of experimental protocols and the technical conduct of experimentation related to his/her research.
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   The candidate should demonstrate that an appropriate level of oral, written and visual communication skill has been acquired.
4. **Identify problems in pharmaceutical sciences**
   The candidate should demonstrate an appropriate level of skill in the identification of meaningful problems in the pharmaceutical sciences and the design of and implementation of appropriate problem-solving methods.

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The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

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Other information

School of Pharmacy policies and procedures for graduate students
pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies (http://www.pharmacy.vcu.edu/programs/pharmd/current/statements_and_policies)
Website for current students:
pharmacy.vcu.edu/programs/graduate/current-students (http://www.pharmacy.vcu.edu/programs/graduate/current-students)
Website for prospective students:
pharmacy.vcu.edu/programs/graduate/prospective-students (http://www.pharmacy.vcu.edu/programs/graduate/prospective-students)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	May 1 (priority consideration for financial aid Feb 1)	GRE, TOEFL (international applicants)
	Spring	Oct 1	

Special requirements

- Pharm.D. or bachelor's degree in a related area

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Degree requirements

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or STAT 543	Statistical Methods I	
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IBMS 600	Laboratory Safety (or equivalent)	1
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PCEU/MEDC/PHAR 614	Research Techniques (variable credit)	
MEDC 526	Research Techniques in Medicinal Chemistry (variable credit)	
Select a minimum of one credit from the following:		1
PCEU 690	Pharmaceutics Research Seminar (variable credit)	
MEDC 690	Departmental Research Seminar (variable credit)	
PHAR 690	Pharmacy Research Seminar (variable credit)	
PSCI 607 & PSCI 608	Introduction to Pharmaceutical Sciences From Bench to Shelf and Introduction to Pharmaceutical Sciences From Bench to Shelf	2
Total Hours		9

In addition to the pharmaceutical sciences core courses, students must fulfill course and other degree requirements in their respective concentrations as outlined below.

Concentration

Course	Title	Hours
BIOS 544	Graduate Research Methods II (or equivalent)	3
or STAT 544	Statistical Methods II	
PHAR 626	Advanced Pharmacotherapy Research Methods	3
PHAR 637	Introduction to Research Methods in Pharmaceutical Sciences	3
Total Hours		9

Electives

Course	Title	Hours
Electives (minimum six credits)		6

A minimum of six elective credit hours is recommended for the M.S. The elective courses taken will generally be selected from a list identified by the major adviser and will be agreed upon by the major adviser and student.

Research

Students are required to complete a thesis. The six credit-hour minimum directed research requirement may be waived for circumstances such as prior related degree. If waived, students must still complete minimum number of hours required for the degree.

Course	Title	Hours
PHAR 697	Directed Research in Pharmacy (variable credit; minimum six credits)	6

Total graduate credit hours required (minimum) 30

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu

Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmacy, Doctor of (Pharm.D.)/ Pharmaceutical Sciences, Doctor of Philosophy (Ph.D.) [combined]

The Pharm.D./Ph.D. program in the School of Pharmacy is a full-time program of professional education that offers an opportunity for advanced study in pharmaceutical sciences. The program recognizes the need for pharmacy practitioners with excellent research skills in clinical, academic, industrial and regulatory environments. The program is designed to take advantage of efficiencies in both the Pharm.D. and Ph.D. curricula and to allow Pharm.D./Ph.D. students to complete the Pharm.D. program requirements after four years and the Ph.D. program requirements within the next two to four years.

Pharm.D./Ph.D. students can focus on the following research areas within the School of Pharmacy: pharmacotherapy and health outcomes, pharmacokinetics/pharmacodynamics, biopharmaceutical analysis, pharmaceutics/physical pharmacy, and medicinal chemistry. Students also may focus on pharmacology and toxicology within the School of Medicine. The choice of research area determines the required graduate course requirements.

During their P-2 through P-4 years, Pharm.D./Ph.D. students will complete the required Pharm.D. curriculum using graduate courses in lieu of required Pharm.D. courses and Pharm.D. electives. In addition, Pharm.D./Ph.D. students will engage in graduate research during the summer semesters following the P-2 and P-4 years. After the P-4 year and beyond (G-1 and G-2), Pharm.D./Ph.D. students will complete both their graduate course requirements and Ph.D. dissertation research project as full-time graduate students. Stipends and tuition reimbursement may be provided for Pharm.D./Ph.D. students serving as graduate teaching or research assistants.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Application to the Doctor of Pharmacy/Doctor of Philosophy program

Students may be admitted into the Pharm.D./Ph.D. program during the first or second year (P-1 and P-2) of enrollment in the Pharm.D. program. Applicants must demonstrate a good academic record, experience in research (e.g., during summer research fellowships after the P-1 year with one of the School of Pharmacy's graduate faculty) and successful completion of the Graduate Record Examination. Additionally, the application must be sponsored by a graduate faculty member as the prospective major graduate adviser. Appropriate progress of Pharm.D./Ph.D. students in the program will be assessed by the Pharm.D./Ph.D. subcommittee after each semester until successful completion of the comprehensive examinations.

Graduate program director
Aron Lichtman, Ph.D.
Associate dean for research and graduate studies
Email: alichtma@vcu.edu
Phone: (804) 628-5233

Additional contact
Shakim Jackson
Education coordinator
Email: sjackson29@vcu.edu
Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Pharmacy, Doctor of (Pharm.D.)/ Pharmaceutical Sciences, Master of Science (M.S.) [combined]

The School of Pharmacy offers a Pharm.D./Master of Science (M.S.) in Pharmaceutical Sciences as a graduate/professional degree program that teaches individuals to analyze and solve problems of interest to pharmacists. Students develop a broad range of skills by taking classes and working closely with faculty. Since the degree is offered concurrently with the professional pharmacy degree, certain efficiencies can be realized that permit students to graduate sooner than might be expected; although, this degree may require up to two years of study beyond the Pharm.D. program depending on the student's educational background and chosen area of study. Students will take the required Pharm.D. curriculum, with selected substitutions of required courses with graduate-level courses, in addition to the graduate curriculum.

In their first two years (P-1 and P-2), the Pharm.D./M.S. students will complete the required Pharm.D. curriculum while attending research seminars and possibly pursuing graduate courses as electives. After admission into the graduate program, students will take required graduate courses in lieu of Pharm.D. courses during the P-3 (G-1) year followed by graduate research during the summer. During the G-2 through G-4 years, students will complete the graduate course requirements and the required Pharm.D. clerkships and work on their graduate research projects. Stipends and tuition may be provided for students serving as graduate teaching or research assistants. During that period, the student will follow procedures prescribed for students in the pharmaceutical sciences.

Students can focus on the following research areas within the School of Pharmacy: pharmacotherapy, pharmacokinetics, biopharmaceutical analysis, pharmaceutics/physical pharmacy, pharmacy administration and medicinal chemistry. Also, students may focus on the following research areas within the School of Medicine: pharmacology and toxicology. The choice of research area determines the required graduate course work.

The Pharm.D./M.S. program in the School of Pharmacy is a full-time program of professional education that offers an opportunity for advanced study in pharmaceutical sciences. The program recognizes the need for pharmacy practitioners with excellent research skills in clinical, academic, industrial and regulatory environments. The program is designed to take advantage of efficiencies in both the Pharm.D. and the M.S. programs and allows students to complete the program requirements of both programs after five or six years. Both degrees are awarded at the same graduation ceremony.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Application to the Pharm.D./M.S. program

Students may be admitted into the program before or during their first two years of enrollment in the Pharm.D. program. Applicants must demonstrate a good academic record, experience in research (e.g., during

summer research fellowships with the school's graduate faculty) and successful completion of the Graduate Record Examination. Additionally, each applicant must be sponsored by a graduate faculty member.

Graduate program director
Aron Lichtman, Ph.D.
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Additional contact
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Phone: (804) 628-4408

Program website: pharmacy.vcu.edu (http://www.pharmacy.vcu.edu)

Department of Medicinal Chemistry

Umesh R. Desai, Ph.D.
Professor and chair

The Department of Medicinal Chemistry applies the latest strategies and concepts from several broad scientific disciplines including synthetic chemistry, molecular modeling, computational biology, structural genomics and pharmacology.

Department of Pharmaceutics

Douglas H. Sweet, Ph.D.
Professor and chair

The Department of Pharmaceutics offers graduate study leading to the degrees of Master of Science and Doctor of Philosophy in Pharmaceutical Sciences. In addition, students may elect to pursue a joint Pharm.D./Ph.D. program. These programs provide the preparation and research experience for academic, federal and industrial careers.

Department of Pharmacotherapy and Outcomes Science

Donald F. Brophy, Pharm.D., FCCP, FASN, BCPS
Professor and chair

The Department of Pharmacotherapy and Outcomes Science is the largest of the three departments at the VCU School of Pharmacy. The focus of the department is pharmacotherapy (the safe and effective use of drugs in humans) and pharmacy administration (evaluation of the social and economic impact of drug therapy in humans and in health care systems).

SCHOOL OF SOCIAL WORK

The oldest of its kind in the South, Virginia Commonwealth University's School of Social Work was established in 1917 as the Richmond School of Social Economy. Later renamed the School of Social Work and Public Health, it became the first unit of Richmond Professional Institute. The school was created initially in response to community needs in working with World War I veterans and their social and health problems. Subsequent development of the school has expanded activity into all areas of human service.

With the creation of VCU in 1968, the School of Social Work became a unit of what is now the university's Monroe Park Campus. The school offers baccalaureate-, master's- and doctoral-level programs in Richmond, and the capital provides educational opportunities in many state government agencies.

Social work education at VCU is highly individualized and is characterized by a close relationship between faculty and students. Faculty members help students learn the form and method of social work practice, and students are encouraged to discover their own unique style of helping others. The school's educational programs are designed to prepare students for practice in many different kinds of social agencies. A combination of classroom courses and concurrent fieldwork experiences facilitates integration of knowledge, attitudes and skills necessary for professional practice. The integrated class and fieldwork curriculum offers students the opportunity to acquire a substantial base in social work practice, patterns of human behavior and development, organization and operation of social welfare programs and policies, the methods of scientific inquiry in social work, and the needs of special populations.

The profession of social work

The goals of the profession of social work are to provide services to persons who are vulnerable due to a lack of personal, social and/or institutional resources to meet their emotional, health and economic needs. Social work practice is the application of professional knowledge, skills and values across a range of settings and populations. The focus of practice is on individuals, couples, families, groups and communities. In addition to direct clinical social work practice, social workers are involved in the administration of human service programs, social planning, the development of social policies, research and evaluation, and teaching.

In order to achieve the goals of promoting social justice and enhancing well-being for individuals, families, groups and communities, social workers provide a variety of services primarily in public and nonprofit organizational contexts. Examples of the range of settings in which social workers practice include community centers, public social services, child welfare, residential treatment facilities, schools, community mental health agencies, family and children's service agencies, psychiatric and acute care hospitals, substance abuse treatment facilities, services for the elderly, court services and adult and juvenile rehabilitation facilities.

Professional education for social work practice dates to the early 1900s. The contributions of the profession are evidenced in health and mental health care, the well-being of children and families, the development and implementation of social policies, the planning, delivery and evaluation of human services, and a broad base of research on the human condition. The knowledge base of the profession and the integration of related social, behavioral and biological sciences acquired through professional education facilitates the contributions of social workers in multidisciplinary contexts.

Social work practice is designed to enrich quality of life by enabling individuals, groups, communities and organizations to achieve their greatest potential development. The goal of the School of Social Work at VCU is to provide professional education in response to these needs.

Administration

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Fax: (804) 828-0716
socialwork.vcu.edu (http://socialwork.vcu.edu)

Beth Angell, Ph.D.
Dean

Humberto Fabelo, Ph.D.
Associate dean for academic and student affairs

Elizabeth M.Z. Farmer, Ph.D.
Associate dean for research

Denise Burnette, Ph.D.
Director of Ph.D. program

Melissa L. Abell, Ph.D.
Director, M.S.W. Program

Ananda Newmark, Ph.D.
Director, B.S.W. Program

Accreditation

VCU's Bachelor of Social Work and Master of Social Work programs are accredited by the Commission on Accreditation of the Council on Social Work Education — the accrediting body for all schools of social work at both the baccalaureate and master's levels. Copies of the Accreditation Standards and Curriculum Policy Statement are available in the Office of the Dean.

Financial assistance

Although financial assistance is limited, some funds are available from a variety of sources. No prospective student should refrain from seeking admission to the school for financial reasons alone. Besides the federal financial aid programs outlined in the undergraduate or graduate study areas of the bulletins, the university and the school also offer scholarships and/or teaching assistantships at all degree levels.

The H.H. Hibbs Loan Fund was established by the School of Social Work Alumni Association for short-term emergency needs. Enrolled students who wish to apply for a loan should discuss this with their faculty adviser and the associate dean.

For more information on these financial aid opportunities, visit the School of Social Work website at socialwork.vcu.edu/student/scholarships (https://socialwork.vcu.edu/student/scholarships).

Continuing education

Continuing education is a vital part of professional development. The School of Social Work offers institutes and workshops as part of the school's commitment to enhance social work practice and broaden educational experiences for students, social workers, field instructors and others in social service delivery systems.

State, regional and local agencies and institutions frequently identify educational and training needs in content or skill areas for selected staff members. The school, through contractual arrangements, contributes expertise in designing and implementing short-term training courses and materials. Offerings are planned throughout the year.

Associations and student interest groups

Alumni Association

The School of Social Work Alumni Association supports the school, its students and faculty. All graduates of the School of Social Work are members of the alumni association. The association falls under the umbrella of the VCU Alumni Association.

B.S.W. Student Association

The Baccalaureate Social Work Student Association, an organization of students in the Bachelor of Social Work Program, was established to facilitate communication among students and between the student body and the school faculty and staff. This organization plays a vital role in the educational process. Through student representation on committees within the school, BSWSA members participate in decision-making processes. In addition, the association enables students to conduct a variety of social and professional activities throughout the year.

M.S.W. Student Association

The Master of Social Work Student Association is the organization of M.S.W. students enrolled in the school. Established for the purposes of facilitating communication among students and between the student body and the school, the association provides a means by which student concerns and ideas can be formulated and acted upon. It also enables students to conduct a variety of social, civic and educational activities throughout the year.

This organization plays a vital role in the educational process. Student contributions to the governance and curriculum of the school are of value to both the institution and the students. Participation in the decision-making process is accomplished through student representation on committees. Faculty and students work closely together throughout the year to meet the needs of graduate social work education. Students participate as full members of committees within the school.

Association of Black Social Workers – VCU Chapter

The Association of Black Social Workers was established to create and maintain an atmosphere of unity and support among black students in the School of Social Work. It serves to assist students in their personal and professional growth and development. Membership in this organization helps students to develop a keen awareness of the acute needs of the black community and the active role that must be assumed by the dedicated black professional social worker in promoting the general welfare of black citizens. To attain these goals, the organization utilizes the educational process and related experiences of students at the school and in fieldwork. Students are encouraged to participate in all phases of the academic environment.

LGBTQIA and Allied Social Work Group VCU

The LGBTQIA and Allied Social Work Group provides a safe space for LGBTQIA and allied social workers to collaborate and engage in advocacy efforts. The organization also promotes awareness of LGBTQIA topics within the VCU social work community through curriculum building, education and social events.

Doctoral Student Association

The Doctoral Student Association is a collegial association available to all doctoral students regardless of full- or part-time status. Its primary purpose is to provide information, resources, advocacy and support to students throughout the doctoral program experience. Governance of the association is conducted on a rotating leadership and consensual basis. The Doctoral Student Association provides doctoral student representatives to various committees of the school governance structure.

Other student interest groups

The School of Social Work supports the development of groups that address a variety of student needs and interests.

M.S.W. Program

Melissa D. Stewart
Director, M.S.W. Program
Email: mdstewart2@vcu.edu
Phone: (804) 828-2007

The M.S.W. Program administers the Master of Social Work curriculum.

- Social Work, Master of (M.S..W.) with a concentration in administration, planning and policy practice (p. 823)
- Social Work, Master of (M.S..W.) with a concentration in clinical practice (p. 828)

Opportunities exist to combine the M.S.W. with certification and degree programs within the university as well as programs offered in conjunction with other institutions. See the Opportunities tab for additional information.

- Social Work, Master of (M.S.W.)/Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined] (p. 834)
- Social Work, Master of (M.S.W.)/Gender Violence Intervention, Certificate in (Post-baccalaureate graduate certificate) [combined] (p. 834)
- Social Work, Master of (M.S.W.)/Nonprofit Management, Certificate in (Post-baccalaureate graduate certificate) [combined] (p. 835)
- Public Health, Master of (M.P.H.)/Social Work, Master of (M.S.W.) [combined] (p. 836)
- Social Work, Master of (M.S.W.)/school social work practice certification [combined]
- Social Work, Master of (M.S.W.)/Divinity, Master of from the Baptist Theological Seminary at Richmond or the Samuel DeWitt Proctor School of Theology at Virginia Union University [combined]
- Social Work, Master of M.S.W.)/Juris Doctor with the University of Richmond [combined]

Social Work, Master of (M.S.W.) with a concentration in administration, planning and policy practice

Program accreditation
Council on Social Work Education

Program goal

The VCU School of Social Work offers a graduate professional curriculum accredited by the Council on Social Work Education leading to the Master of Social Work degree. The purpose of the M.S.W. program at VCU is to educate persons for advanced practice in either clinical social work or social work administration, planning and policy practice. The guiding principle in educating students is the promotion of a more just society that includes a commitment to the value of diversity and social work practice in a multicultural society. The VCU School of Social Work emphasizes critical thinking, self-awareness, data-based decision-making and ethical integrity. Graduates of this program will be able to address personal and social problems; formulate, implement and evaluate policies and programs; engage in knowledge development for the profession; and influence community decision-making. The educational program focuses on service to and empowerment of people who experience oppression or vulnerability due to inadequate or inequitable distribution of personal, social or institutional resources. Within this context, social work practice is defined as the application of professional knowledge, skills and values across a range of settings and populations for the prevention and amelioration of personal and social problems. The interactions among persons and their environments are the primary targets of social work practice. Services provided by social workers include the restoration, rehabilitation, maintenance and enhancement of optimal functioning of individuals, families, groups, communities and organizations. Knowledge for social work practice is based on analysis and critical application of qualitative and quantitative research from within the profession and related social, behavioral and biological sciences. Skill in professional practice is based on the differential application of theories and research findings about people in their sociocultural and organizational contexts. Skill is developed by the social worker through the educational process, self-critical practice and the use of supervision and consultation. Values in social work practice are articulated in the profession's code of ethics and reflect the core values of service, social justice, dignity and worth of each individual, importance of human relationships, integrity, and competence.

Student learning outcomes

1. A foundation of knowledge, skills, ethics and values essential for work with individuals, families, groups, communities and organizations
2. A concentration that prepares students for advanced practice in clinical social work or social work administration, planning and policy practice in a range of settings
3. To apply the profession's values and ethical principles
4. The implications of diversity by through education on identifying cultural strengths and ways to counteract individual and institutional prejudice, oppression and discrimination
5. To use research methods to analyze and critically evaluate professional practice, programs and service delivery systems
6. Advocacy and involvement in advocacy to affect social and economic justice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.W.	Summer (advanced standing format)	Dec 1	

Fall (regular standing formats – all on-campus part- and full-time and distance education)	Third Wed in Jan

Special requirements

- The School of Social Work requires a specific outline for the personal statement that is different from what is shown in the graduate admissions website and also requires that a checklist be submitted with application materials. Please visit the School of Social Work website for this specific information.

Full-time, part-time and distance education format applicants are admitted to begin study in the fall semester only. Advanced standing format applicants are admitted for the summer session only. At the time of application, applicants may apply for only one of the following: full-time on-campus Richmond, part-time on-campus Richmond, part-time distance education or advanced standing. Application forms and instructions for applying to all graduate programs are available on the Graduate Admissions website (http://www.graduate.admissions.vcu.edu).

In addition to the general admission requirements of the VCU Graduate School (p. 34), the School of Social Work has established the following minimum criteria for admission to the 60-credit hour full-time or part-time format:

1. A bachelor's degree from an accredited college or university
2. A cumulative GPA of 3.0 on a 4.0 scale for all undergraduate course work and a 3.0 (B) for the last 60 credit hours
3. A broad liberal arts background. Applicants must have completed a minimum of 30 semester credit hours in the liberal arts. Applicants must have completed at least one course (unless otherwise specified) in each of the following four areas:
   a. Mathematics/computer sciences: math, logic, statistics, computer sciences
   b. Humanities: English composition, literature, art history, music appreciation, philosophy, languages, religious studies, multicultural studies
   c. Social and behavioral sciences: psychology, sociology, anthropology, history, political science, economics (with at least three credit hours in psychology and three credit hours in sociology)
   d. Biology and physical sciences: anatomy/physiology, botany, general biology, zoology, chemistry, ecology, physics, geology, astronomy (with a minimum of three credit hours in human biology content)

Applicants who have not completed all the liberal arts prerequisites may be considered for admission but must have completed the prerequisite courses prior to enrollment and must provide official transcripts to document their completion. Courses may be completed at a community college or four-year institution. In addition to the academic requirements, the applicant must demonstrate commitment to social welfare and social justice. This should be reflected in (1) the personal statement and (2) the applicant's academic background, social work employment, internships and volunteer work in community agencies serving vulnerable and/or oppressed populations.

General admission procedures

Applications will only be reviewed when they are complete and received by the deadline. This includes the application form, three letters of reference (such as from faculty, employers and/or colleagues who know the applicant's academic and work/volunteer abilities), official transcripts from all undergraduate and graduate colleges and universities attended, including VCU transcripts from those who are VCU graduates, a personal statement based upon the outline provided on the M.S.W. website (http://socialwork.vcu.edu/programs/msw/admission.html) and an employment and volunteer experience resume. The applicant is responsible for ensuring that all materials are submitted prior to the application deadline.

Admission to the advanced standing format

The advanced standing format leads to a Master of Social Work degree upon completion of 42 credit hours. This format begins in late May, continues through the summer and culminates with graduation the following May. The advanced standing format is offered full-time only and cannot be pursued on a part-time basis. Admission to the advanced standing format is available to a select group of students with a bachelor's degree (B.S.W.) from an undergraduate social work program accredited by the Council on Social Work Education, completed no more than five years prior to the date of application to the M.S.W. program. The minimum requirement for admission to the advanced standing format is a 3.2 GPA on a 4.0 scale for all undergraduate course work. As part of the application packet, applicants must submit their field practicum evaluation(s) and a reference letter from the field practicum faculty. Applicants who meet these criteria will be scheduled for a structured on-campus interview, which includes a written case assessment. Refer to the M.S.W. website (http://socialwork.vcu.edu/programs/msw/admission.html) for more information.

Transfer admits

Applicants transferring from other CSWE-accredited M.S.W. programs must submit course syllabi, field practicum evaluations and a statement of good standing from the dean or director of the program from which the student is transferring. These materials must be submitted in addition to the required application form, transcripts, personal statement, resume and reference letters. No more than 30 credit hours will be accepted in transfer, and transfer credit will be awarded in accordance with university policies governing transfer credit and time limits for degree completion.

Applicants from non-social work graduate programs must submit course syllabi for transfer evaluation. A maximum of six credit hours of elective course work may be accepted in transfer from non-social work graduate programs in accordance with Graduate School policies governing transfer credit and time limits for degree completion. No course credit is given for life or work experience.

Course waiver information for new M.S.W. students

Students may request to be waived from courses in the M.S.W. program if they can demonstrate they have satisfactorily completed the equivalent courses. Students must present evidence of content equivalency to the M.S.W. program director and have earned an A or B grade in the courses that are the basis for the waiver request; these courses must have been completed within the past five years. A portfolio process is used to assess equivalency. Graduate students from non-M.S.W. programs, from B.S.W. programs (but not in the advanced standing format), and from B.A., B.S. or other undergraduate programs may be waived from no more than three of the following foundation courses:

Course	Title	Hours
SLWK 601 & SLWK 610	Human Behavior in the Social Environment I and Human Behavior in the Social Environment II	6
SLWK 609	Foundations of Research in Social Work Practice	3

The course waiver does not result in award of credit. Credit may be awarded only through transfer of graduate courses (see Transfer Policy). Students who are granted waivers but not transfer credit hours must take elective courses to fulfill the number of credit hours that have been waived. Students interested in pursuing a waiver for one or more of the specified foundation courses should contact the M.S.W. program office to request the Equivalency Portfolio Form(s) and instructions.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the regular standing format for the M.S.W. degree requires the completion of 60 credit hours of graduate study (two years of full-time study). The first 30 credit hours (foundation curriculum) may be taken in one academic year on a full-time basis or may be extended to a maximum of two years in the structured part-time format. To earn the M.S.W. degree in the advanced standing format requires 42 credits of full-time graduate study. Students in the advanced standing format do not complete the foundation curriculum but instead take 12 credit hours during the summer prior to entering the concentration curriculum.

All students select an area of concentration for the last 30 credit hours, which can be completed in one academic year on a full-time basis or extended to a maximum of two years in the structured part-time format. Students are usually in a field instruction practicum two days each week during the foundation curriculum and three days each week during the concentration curriculum. Course credit for work or life experience is not granted in lieu of M.S.W. course credit hours.

The purpose of the Master of Social Work program is to prepare graduate-level social workers with mastery of the knowledge, values and skills essential for advanced social work practice in a multicultural society.

The foundation curriculum comprises the first 30 credit hours of the M.S.W. program. The purpose of the foundation practice, in laying the groundwork for concentration study, is to develop the knowledge and skill base necessary to apply and carry out core competencies (relationship building, problem identification, assessment, selecting and planning interventions, implementation, and evaluation) with individuals, families, groups, communities and organizations. Foundation practice emphasizes critical thinking, client strengths, commitment to social work values and ethical principles, self-awareness, professional development, evidence-based decision-making, multicultural competency and social and economic justice. The foundation curriculum includes courses in social work practice, human behavior, social policy, social justice, research and field instruction.

Concentration options

After completion of the foundation year of study or summer studies for advanced standing, M.S.W. students choose an advanced concentration in clinical practice or in administration, planning and policy practice. The concentration curriculum prepares graduates for active roles in practice and program evaluation and in the generation of knowledge for future practice, programs and policy.

Administration, planning and policy practice concentration (SWAPPP)

The concentration in administration, planning and policy practice prepares graduates to become leaders skilled in analyzing, formulating, implementing and evaluating policies, plans and programs. The knowledge, values and skills that are taught emphasize current theory and research through classroom and field-based experiences. Practice takes place in the context of a complex, changing environment in which communities and governmental, legislative, nonprofit and for-profit organizations advocate for, plan and deliver social services and advocate for social change. The major themes within the integrated curriculum are social and economic justice, diversity, leadership and advocacy. This concentration is not available to distance education students at this time.

Curriculum requirements

Foundation courses

Course	Title	Hours
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3
Select one of the following:		6
SLWK 693 & SLWK 694	Foundation Field Instruction I and Foundation Field Instruction II	
SLWK 695	Block Foundation Field Instruction [1]	
Total Hours		30

1

Part-time students may choose a block field placement in lieu of SLWK 693 and SLWK 694. Only one field placement can be a block placement

In the advanced standing format students do not take foundation courses outlined above, but instead take 12 credit hours in the summer prior to their concentration year that include courses in practice/human behavior, policy, and research, in addition to completing a field education course with a field placement that will extend throughout their concentration year of study. The purpose of this curriculum is to enhance and restore understanding of the foundation curriculum content for entering BSW students prior to entering the concentration year.

Advanced standing format

Summer semester prior to concentration

Course	Title	Hours
SLWK 607	Social Work Practice with Individuals, Families and Groups for Advanced-standing Students	3
SLWK 608	Social Work Practice in Organizations and Communities for Advanced-standing Students	3
SLWK 611	Social Work Research for Advanced-standing Students	3
SLWK 612	Advanced-standing Field Instruction	3
Total Hours		12

Required administration, planning and policy concentration courses

Course	Title	Hours
SLWK 710	Concentration Social Policy	3
SLWK 711	Strategies for Social Work Planning and Administrative Practice	3
SLWK 712	Social Work Planning and Administrative Practice I	3
SLWK 713	Social Work Planning and Administrative Practice II	3
SLWK 714	Research for Social Work Administration, Planning and Policy Practice I	3
SLWK 715	Research for Social Work Administration, Planning and Policy Practice II	3
Select one of the following:		6
SLWK 793 & SLWK 794	Concentration Field Instruction I and Concentration Field Instruction II	
SLWK 795	Concentration Block Field Instruction [1]	
Total Hours		24

[1]

Part-time students may choose a block field placement in lieu of SLWK 793 and SLWK 794. Only one field placement can be a block placement

Electives

Course	Title	Hours
Complete six additional credit hours of electives chosen from SLWK 717-SLWK 792. Electives from outside the School of Social Work are accepted as part of the combined offerings for dual degrees and certificates. Other electives from outside the school may be accepted with prior approval from the M.S.W. program director.		6
Total Hours		6

Total graduate credit hours required (minimum) 60

Sample plan of study

Year one

Fall semester		**Hours**
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3
SLWK 693	Foundation Field Instruction I	3
	Term Hours:	15
Spring semester		
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3
SLWK 694	Foundation Field Instruction II	3
	Term Hours:	15
Year two		
Fall semester		
SLWK 711	Strategies for Social Work Planning and Administrative Practice	3
SLWK 712	Social Work Planning and Administrative Practice I	3
SLWK 714	Research for Social Work Administration, Planning and Policy Practice I	3
SLWK 793	Concentration Field Instruction I	3
Elective		3
	Term Hours:	15
Spring semester		
SLWK 710	Concentration Social Policy	3
SLWK 713	Social Work Planning and Administrative Practice II	3
SLWK 715	Research for Social Work Administration, Planning and Policy Practice II	3
SLWK 794	Concentration Field Instruction II	3
Elective		3
	Term Hours:	15
	Total Hours:	60

Total graduate credit hours required (minimum) 60

Students pursuing the Master of Social Work have an opportunity to combine their studies and complete other degree programs offered within the university and some outside institutions in these areas.

Aging studies certificate

The School of Social Work, in conjunction with the Department of Gerontology in the College of Health Professions at VCU, offers students an opportunity to earn their Master of Social Work along with a post-baccalaureate graduate certificate in aging studies. Students interested in working with older adults may earn a Certificate in Aging Studies (p. 146) while completing their M.S.W. requirements. Students must take 11 credit hours in the Department of Gerontology; six of these hours would apply as electives in the M.S.W. program. M.S.W. students are required to complete a research project with a focus in gerontology as well as a field placement in a geriatric setting.

Application process

Students must meet the admissions requirements of both the M.S.W. program and the Certificate in Aging Studies. Admission into one program does not guarantee admission into the other. For additional information, contact:

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

E. Ayn Welleford, Ph.D.
Chair, Department of Gerontology
ewellefo@vcu.edu
Phone: (804) 828-1565

Master of Divinity (M.Div)

The combination of the Master of Social Work and the Master of Divinity is a four-year professional program offered by VCU in cooperation with Richmond Theological Consortium schools, which include Baptist Theological Seminary and the Samuel DeWitt Proctor School of Theology at Virginia Union University. This dual-degree program prepares students for service in occupations where social work and the church's ministries intersect, enabling social workers to perform and evaluate social work practices as they relate to biblical, theological, ethical, educational and pastoral perspectives. Graduates are equipped for various forms of ministry in which clinical and administrative skills in social work are critical.

This program requires four continuous years of study and leads to an M.S.W. conferred by VCU and a Master of Divinity conferred by the chosen RTC school. Students need to apply and be accepted to both programs and may begin study at either institution following the approved curriculum plan. Alternately a student may begin at either VCU or the seminary and then, in accordance with application deadlines, apply for admission to the other school during the first year of study.

Application process

Prospective students apply to the VCU School of Social Work and one of the participating theological schools, must meet both sets of admission standards and must be accepted to both programs. For the M.S.W. program, refer to the Admission page (https://socialwork.vcu.edu/programs/msw/admission.html) of the M.S.W. website. For information about admission to an RTC Master of Divinity program, contact one of the following schools:

Baptist Theological Seminary at Richmond
3400 Brook Road
Richmond, VA 23286
Phone: (804) 345-2877

Samuel DeWitt Proctor School of Theology
1500 N. Lombardy St.
Richmond, VA 23220
Phone: (804) 257-5715

Gender violence intervention certificate

The combined Master of Social Work and Certificate in Gender Violence Intervention (p. 604) is a coordinated effort among the L. Douglas Wilder School of Government and Public Affairs, the School of Social Work and community advocates working in the area of sexual and domestic violence.

Application process

Apply online at **VCU Graduate Admissions**. For additional information, contact:

Elizabeth Cramer, Ph.D.
Professor, School of Social Work
ecramer@vcu.edu
Phone: (804) 828-9029

Sarah Jane Brubaker, Ph.D.
Director, Gender Violence Intervention Program
sbrubaker@vcu.edu
Phone: (804) 827-2400

Juris Doctor (J.D.)

Through a cooperative agreement with the University of Richmond T.C. Williams Law School (https://lawcatalog.richmond.edu/dual-degree), selected students in either school may pursue a combined four-year curriculum of graduate study leading to the degrees of Master of Social Work and Juris Doctor. This program is established in recognition of the role of public law in social and economic life. The dual-degree program prepares professionals to be well-versed in the values, knowledge and skills of both fields, bringing an integrated base of competency to the resolution of human and social problems. The time normally required for completion of the integrated four-year curriculum is one academic year less than if each degree were pursued separately. Elective courses will enable students to select areas in law and social work which meet their particular interests.

Application process

Applicants must successfully meet the admission requirements of both schools and, upon admission, are assigned an adviser in each school. Students may begin the course work in either school, with the sequence of courses being determined by the point of entry. For more information, contact:

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

James Gibson, J.D.
Professor of law
University of Richmond, T.C. Williams Law School
jgibson@richmond.edu
Phone: (804) 287-6398

Nonprofit management certificate

Through a cooperative arrangement with the L. Douglas Wilder School of Government and Public Affairs, M.S.W. students may simultaneously earn the post-baccalaureate graduate Certificate in Nonprofit Management (p. 611) offered by the Wilder School. Students gain knowledge and skills that they will need to become leaders and change agents in this rapidly growing sector.

Application process

To earn a Certificate in Nonprofit management in conjunction with the M.S.W., students will complete a graduate school application for the certificate program and pay the required fee to the university.

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

Richard F. Huff, Ph.D.
Program chair, Public Administration
rrhuff@vcu.edu
Phone: (804) 828-9813

Master of Public Health (M.P.H)

Through a collaborative program between the VCU School of Social Work and the Division of Epidemiology in the VCU School of Medicine's Department of Family Medicine and Population Health, students complete a three-year full-time program of study, including summer course work, to obtain the Master of Social Work and Master of Public Health (p. 757) degrees. This dual-degree program prepares graduates to work with individuals, families, groups, communities and/or organizations; to advocate for social, health care and economic justice in a diverse and multicultural society; and to promote physical and mental health across the life course.

Application process

Prospective students are required to apply separately to both programs and meet both sets of admissions requirements. Once admitted, student and adviser will work together to develop a plan of study. It is preferable that students apply to both programs at the same time so that the structured dual-degree curriculum can be optimally planned. Students in one program may also apply to the second program during the first year of study. For more information, contact:

Sarah K. Price, Ph.D.
Professor, School of Social Work
skprice@vcu.edu
Phone: (804) 828-0579

Saba Masho, M.D., Dr.P.H.
Associate professor, Division of Epidemiology, Department of Family Medicine and Population Health
saba.masho@vcuhealth.org
Phone: (804) 628-2509

Graduate program director
Melissa D. Stewart, Ph.D.
M.S.W. program director
Email: mdstewart2@vcu.edu
Phone: (804) 828-2007

Program website: socialwork.vcu.edu (http://www.socialwork.vcu.edu)

Social Work, Master of (M.S.W.) with a concentration in clinical practice

Program accreditation
Council on Social Work Education

Program goal

The VCU School of Social Work offers a graduate professional curriculum accredited by the Council on Social Work Education leading to the Master of Social Work degree. The purpose of the M.S.W. program at VCU is to educate persons for advanced practice in either clinical social work or social work administration, planning and policy practice. The guiding principle in educating students is the promotion of a more just society that includes a commitment to the value of diversity and social work practice in a multicultural society. The VCU School of Social Work emphasizes critical thinking, self-awareness, data-based decision-making and ethical integrity. Graduates of this program will be able to address personal and social problems; formulate, implement and evaluate policies and programs; engage in knowledge development for the profession; and influence community decision-making. The educational program focuses on service to and empowerment of people who experience oppression or vulnerability due to inadequate or inequitable distribution of personal, social or institutional resources. Within this context, social work practice is defined as the application of professional knowledge, skills and values across a range of settings and populations for the prevention and amelioration of personal and social problems. The interactions among persons and their environments are the primary targets of social work practice. Services provided by social workers include the restoration, rehabilitation, maintenance and enhancement of optimal functioning of individuals, families, groups, communities and organizations. Knowledge for social work practice is based on analysis and critical application of qualitative and quantitative research from within the profession and related social, behavioral and biological sciences. Skill in professional practice is based on the differential application of theories and research findings about people in their sociocultural and organizational contexts. Skill is developed by the social worker through the educational process, self-critical practice and the use of supervision and consultation. Values in social work practice are articulated in the profession's code of ethics and reflect the core values of service, social justice, dignity and worth of each individual, importance of human relationships, integrity, and competence.

Student learning outcomes

1. A foundation of knowledge, skills, ethics and values essential for work with individuals, families, groups, communities and organizations
2. A concentration that prepares students for advanced practice in clinical social work or social work administration, planning and policy practice in a range of settings
3. To apply the profession's values and ethical principles
4. The implications of diversity by through education on identifying cultural strengths and ways to counteract individual and institutional prejudice, oppression and discrimination
5. To use research methods to analyze and critically evaluate professional practice, programs and service delivery systems
6. Advocacy and involvement in advocacy to affect social and economic justice

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all

graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.W.	Summer (advanced standing format)	Dec 1	
	Fall (regular standing formats – all on-campus part- and full-time and distance education)	Third Wed in Jan	

Special requirements

- The School of Social Work requires a specific outline for the personal statement that is different from what is shown in the graduate admissions website and also requires that a checklist be submitted with application materials. Please visit the School of Social Work website for this specific information.

Full-time, part-time and distance education format applicants are admitted to begin study in the fall semester only. Advanced standing format applicants are admitted for the summer session only. At the time of application, applicants may apply for only one of the following: full-time on-campus Richmond, part-time on-campus Richmond, part-time distance education or advanced standing. Application forms and instructions for applying to all graduate programs are available on the Graduate Admissions website (http://www.graduate.admissions.vcu.edu).

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1. A bachelor's degree from an accredited college or university
2. A cumulative GPA of 3.0 on a 4.0 scale for all undergraduate course work and a 3.0 (B) for the last 60 credit hours
3. A broad liberal arts background. Applicants must have completed a minimum of 30 semester credit hours in the liberal arts. Applicants must have completed at least one course (unless otherwise specified) in each of the following four areas:
   a. Mathematics/computer sciences: math, logic, statistics, computer sciences
   b. Humanities: English composition, literature, art history, music appreciation, philosophy, languages, religious studies, multicultural studies
   c. Social and behavioral sciences: psychology, sociology, anthropology, history, political science, economics (with at least three credit hours in psychology and three credit hours in sociology)
   d. Biology and physical sciences: anatomy/physiology, botany, general biology, zoology, chemistry, ecology, physics, geology, astronomy (with a minimum of three credit hours in human biology content)

Applicants who have not completed all the liberal arts prerequisites may be considered for admission but must have completed the prerequisite courses prior to enrollment and must provide official transcripts to document their completion. Courses may be completed at a community college or four-year institution. In addition to the academic requirements, the applicant must demonstrate commitment to social welfare and social justice. This should be reflected in (1) the personal statement and (2) the applicant's academic background, social work employment, internships and volunteer work in community agencies serving vulnerable and/or oppressed populations.

General admission procedures

Applications will only be reviewed when they are complete and received by the deadline. This includes the application form, three letters of reference (such as from faculty, employers and/or colleagues who know the applicant's academic and work/volunteer abilities), official transcripts from all undergraduate and graduate colleges and universities attended,

including VCU transcripts from those who are VCU graduates, a personal statement based upon the outline provided on the M.S.W. website (http://socialwork.vcu.edu/programs/msw/admission.html) and an employment and volunteer experience resume. The applicant is responsible for ensuring that all materials are submitted prior to the application deadline.

Admission to the advanced standing format

The advanced standing format leads to a Master of Social Work degree upon completion of 42 credit hours. This format begins in late May, continues through the summer and culminates with graduation the following May. The advanced standing format is offered full-time only and cannot be pursued on a part-time basis. Admission to the advanced standing format is available to a select group of students with a bachelor's degree (B.S.W.) from an undergraduate social work program accredited by the Council on Social Work Education, completed no more than five years prior to the date of application to the M.S.W. program. The minimum requirement for admission to the advanced standing format is a 3.2 GPA on a 4.0 scale for all undergraduate course work. As part of the application packet, applicants must submit their field practicum evaluation(s) and a reference letter from the field practicum faculty. Applicants who meet these criteria will be scheduled for a structured on-campus interview, which includes a written case assessment. Refer to the M.S.W. website (http://socialwork.vcu.edu/programs/msw/admission.html) for more information.

Transfer admits

Applicants transferring from other CSWE-accredited M.S.W. programs must submit course syllabi, field practicum evaluations and a statement of good standing from the dean or director of the program from which the student is transferring. These materials must be submitted in addition to the required application form, transcripts, personal statement, resume and reference letters. No more than 30 credit hours will be accepted in transfer, and transfer credit will be awarded in accordance with university policies governing transfer credit and time limits for degree completion.

Applicants from non-social work graduate programs must submit course syllabi for transfer evaluation. A maximum of six credit hours of elective course work may be accepted in transfer from non-social work graduate programs in accordance with Graduate School policies governing transfer credit and time limits for degree completion. No course credit is given for life or work experience.

Course waiver information for new M.S.W. students

Students may request to be waived from courses in the M.S.W. program if they can demonstrate they have satisfactorily completed the equivalent courses. Students must present evidence of content equivalency to the M.S.W. program director and have earned an A or B grade in the courses that are the basis for the waiver request; these courses must have been completed within the past five years. A portfolio process is used to assess equivalency. Graduate students from non-M.S.W. programs, from B.S.W. programs (but not in the advanced standing format), and from B.A., B.S. or other undergraduate programs may be waived from no more than three of the following foundation courses:

Course	Title	Hours
SLWK 601 & SLWK 610	Human Behavior in the Social Environment I and Human Behavior in the Social Environment II	6
SLWK 609	Foundations of Research in Social Work Practice	3

The course waiver does not result in award of credit. Credit may be awarded only through transfer of graduate courses (see Transfer Policy). Students who are granted waivers but not transfer credit hours must take elective courses to fulfill the number of credit hours that have been waived. Students interested in pursuing a waiver for one or more of the specified foundation courses should contact the M.S.W. program office to request the Equivalency Portfolio Form(s) and instructions.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), the regular standing format for the M.S.W. degree requires the completion of 60 credit hours of graduate study (two years of full-time study). The first 30 credit hours (foundation curriculum) may be taken in one academic year on a full-time basis or may be extended to a maximum of two years in the structured part-time format. To earn the M.S.W. degree in the advanced standing format requires 42 credits of full-time graduate study. Students in the advanced standing format do not complete the foundation curriculum but instead take 12 credit hours during the summer prior to entering the concentration curriculum.

All students select an area of concentration for the last 30 credit hours, which can be completed in one academic year on a full-time basis or extended to a maximum of two years in the structured part-time format. Students are usually in a field instruction practicum two days each week during the foundation curriculum and three days each week during the concentration curriculum. Course credit for work or life experience is not granted in lieu of M.S.W. course credit hours.

The purpose of the Master of Social Work program is to prepare graduate-level social workers with mastery of the knowledge, values and skills essential for advanced social work practice in a multicultural society.

The foundation curriculum comprises the first 30 credit hours of the M.S.W. program. The purpose of the foundation practice, in laying the groundwork for concentration study, is to develop the knowledge and skill base necessary to apply and carry out core competencies (relationship building, problem identification, assessment, selecting and planning interventions, implementation, and evaluation) with individuals, families, groups, communities and organizations. Foundation practice emphasizes critical thinking, client strengths, commitment to social work values and ethical principles, self-awareness, professional development, evidence-based decision-making, multicultural competency and social and economic justice. The foundation curriculum includes courses in social work practice, human behavior, social policy, social justice, research and field instruction.

Concentration options

After completion of the foundation year of study or summer studies for advanced standing, M.S.W. students choose an advanced concentration in clinical practice or in administration, planning and policy practice. The concentration curriculum prepares graduates for active roles in practice and program evaluation and in the generation of knowledge for future practice, programs and policy.

Clinical practice concentration

Clinical social work practice involves a mutual problem-solving process in which multidimensional assessment, goal setting, planned intervention and evaluation are prominent components, all of which are informed by current scientific knowledge. All clinical practice is grounded in the

values and purposes of the social work profession. The goal of clinical social work is to promote effective coping with life challenges and transitions. This is achieved by helping people solve problems, change dysfunctional behavior, resolve emotional and interpersonal conflicts, develop and use social networks and resources, and maintain achieved capacities and strengths. This goal rests on the fundamental belief in the dignity of all human beings and in communal responsibility for all members of the multicultural society.

Clinical social work practice takes place in the context of a purposeful relationship. The conscious use of the professional self is central in building and maintaining such relationships. Interventions may involve therapeutic, supportive, educational and resource-management activities. These interventions are based on a process of strengthening and reordering organizational structures in the lives of clients: intrapersonal (including intrapsychic), interpersonal, institutional and/or social.

Curriculum requirements

Foundation courses

Course	Title	Hours
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3
Select one of the following:		6
SLWK 693 & SLWK 694	Foundation Field Instruction I and Foundation Field Instruction II	
SLWK 695	Block Foundation Field Instruction [1]	
Total Hours		30

1

Part-time students may choose a block field placement in lieu of SLWK 693 and SLWK 694. Only one field placement can be a block placement

In the advanced standing format students do not take foundation courses outlined above, but instead take 12 credit hours in the summer prior to their concentration year that include courses in practice/human behavior, policy, and research, in addition to completing a field education course with a field placement that will extend throughout their concentration year of study. The purpose of this curriculum is to enhance and restore understanding of the foundation curriculum content for entering BSW students prior to entering the concentration year.

Advanced standing format

Summer semester prior to concentration

Course	Title	Hours
SLWK 607	Social Work Practice with Individuals, Families and Groups for Advanced-standing Students	3
SLWK 608	Social Work Practice in Organizations and Communities for Advanced-standing Students	3
SLWK 611	Social Work Research for Advanced-standing Students	3
SLWK 612	Advanced-standing Field Instruction	3
Total Hours		12

Required clinical concentration courses

Course	Title	Hours
SLWK 703	Mental, Emotional and Behavioral Disorders	3
SLWK 704	Clinical Social Work Practice I	3
SLWK 705	Clinical Social Work Practice II	3
SLWK 706	Research for Clinical Social Work Practice I	3
SLWK 707	Research for Clinical Social Work Practice II	3
SLWK 710	Concentration Social Policy	3
Select one of the following:		6
SLWK 793 & SLWK 794	Concentration Field Instruction I and Concentration Field Instruction II	
SLWK 795	Concentration Block Field Instruction [1]	
Total Hours		24

1

Part-time students may choose a block field placement in lieu of SLWK 793 and SLWK 794. Only one field placement can be a block placement.

Electives

Course	Title	Hours
Complete six additional credit hours of electives chosen from SLWK 717-SLWK 792. Electives from outside the School of Social Work are accepted as part of the combined offerings for dual degrees and certificates. Other electives from outside the school may be accepted with prior approval from the M.S.W. program director.		6
Total Hours		6

Total graduate credit hours required (minimum) 60

Sample plan of study

Year one

Fall semester		Hours
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3

SLWK 693	Foundation Field Instruction I	3
	Term Hours:	15
Spring semester		
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3
SLWK 694	Foundation Field Instruction II	3
	Term Hours:	15
Year two		
Fall semester		
SLWK 703	Mental, Emotional and Behavioral Disorders	3
SLWK 704	Clinical Social Work Practice I	3
SLWK 706	Research for Clinical Social Work Practice I	3
SLWK 793	Concentration Field Instruction I	3
Elective		3
	Term Hours:	15
Spring semester		
SLWK 705	Clinical Social Work Practice II	3
SLWK 707	Research for Clinical Social Work Practice II	3
SLWK 710	Concentration Social Policy	3
SLWK 794	Concentration Field Instruction II	3
Elective		3
	Term Hours:	15
	Total Hours:	60

Total graduate credit hours required (minimum) 60

Students pursuing the Master of Social Work have an opportunity to combine their studies and complete other degree programs offered within the university and some outside institutions in these areas.

Aging studies certificate

The School of Social Work, in conjunction with the Department of Gerontology in the College of Health Professions at VCU, offers students an opportunity to earn their Master of Social Work along with a post-baccalaureate graduate certificate in aging studies. Students interested in working with older adults may earn a Certificate in Aging Studies (p. 146) while completing their M.S.W. requirements. Students must take 11 credit hours in the Department of Gerontology; six of these hours would apply as electives in the M.S.W. program. M.S.W. students are required to complete a research project with a focus in gerontology as well as a field placement in a geriatric setting.

Application process

Students must meet the admissions requirements of both the M.S.W. program and the Certificate in Aging Studies. Admission into one program does not guarantee admission into the other. For additional information, contact:

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

E. Ayn Welleford, Ph.D.
Chair, Department of Gerontology
ewellefo@vcu.edu
Phone: (804) 828-1565

Master of Divinity (M.Div)

The combination of the Master of Social Work and the Master of Divinity is a four-year professional program offered by VCU in cooperation with Richmond Theological Consortium schools, which include Baptist Theological Seminary and the Samuel DeWitt Proctor School of Theology at Virginia Union University. This dual-degree program prepares students for service in occupations where social work and the church's ministries intersect, enabling social workers to perform and evaluate social work practices as they relate to biblical, theological, ethical, educational and pastoral perspectives. Graduates are equipped for various forms of ministry in which clinical and administrative skills in social work are critical.

This program requires four continuous years of study and leads to an M.S.W. conferred by VCU and a Master of Divinity conferred by the chosen RTC school. Students need to apply and be accepted to both programs and may begin study at either institution following the approved curriculum plan. Alternately a student may begin at either VCU or the seminary and then, in accordance with application deadlines, apply for admission to the other school during the first year of study.

Application process

Prospective students apply to the VCU School of Social Work and one of the participating theological schools, must meet both sets of admission standards and must be accepted to both programs. For the M.S.W. program, refer to the Admission page (https://socialwork.vcu.edu/programs/msw/admission.html) of the M.S.W. website. For information about admission to an RTC Master of Divinity program, contact one of the following schools:

Baptist Theological Seminary at Richmond
3400 Brook Road
Richmond, VA 23286
Phone: (804) 345-2877

Samuel DeWitt Proctor School of Theology
1500 N. Lombardy St.
Richmond, VA 23220
Phone: (804) 257-5715

Gender violence intervention certificate

The combined Master of Social Work and Certificate in Gender Violence Intervention (p. 604) is a coordinated effort among the L. Douglas Wilder School of Government and Public Affairs, the School of Social Work and community advocates working in the area of sexual and domestic violence.

Application process

Apply online at **VCU Graduate Admissions**. For additional information, contact:

Elizabeth Cramer, Ph.D.
Professor, School of Social Work
ecramer@vcu.edu

Phone: (804) 828-9029

Sarah Jane Brubaker, Ph.D.
Director, Gender Violence Intervention Program
sbrubaker@vcu.edu
Phone: (804) 827-2400

Juris Doctor (J.D.)

Through a cooperative agreement with the University of Richmond T.C. Williams Law School (https://lawcatalog.richmond.edu/dual-degree), selected students in either school may pursue a combined four-year curriculum of graduate study leading to the degrees of Master of Social Work and Juris Doctor. This program is established in recognition of the role of public law in social and economic life. The dual-degree program prepares professionals to be well-versed in the values, knowledge and skills of both fields, bringing an integrated base of competency to the resolution of human and social problems. The time normally required for completion of the integrated four-year curriculum is one academic year less than if each degree were pursued separately. Elective courses will enable students to select areas in law and social work which meet their particular interests.

Application process

Applicants must successfully meet the admission requirements of both schools and, upon admission, are assigned an adviser in each school. Students may begin the course work in either school, with the sequence of courses being determined by the point of entry. For more information, contact:

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

James Gibson, J.D.
Professor of law
University of Richmond, T.C. Williams Law School
jgibson@richmond.edu
Phone: (804) 287-6398

Nonprofit management certificate

Through a cooperative arrangement with the L. Douglas Wilder School of Government and Public Affairs, M.S.W. students may simultaneously earn the post-baccalaureate graduate Certificate in Nonprofit Management (p. 611) offered by the Wilder School. Students gain knowledge and skills that they will need to become leaders and change agents in this rapidly growing sector.

Application process

To earn a Certificate in Nonprofit management in conjunction with the M.S.W., students will complete a graduate school application for the certificate program and pay the required fee to the university.

Melissa Stewart, Ph.D.
M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

Richard F. Huff, Ph.D.
Program chair, Public Administration
rrhuff@vcu.edu
Phone: (804) 828-9813

School social work certificate

In conjunction with the VCU School of Education, students may meet Virginia Department of Education standards for certification as school social workers in Virginia, while completing requirements for the M.S.W. degree. Students interested in a certification in school social work should contact their advisers during the first semester of the M.S.W. program.

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M.S.W. Program Director
mdstewart2@vcu.edu
Phone: (804) 828-2007

Master of Public Health (M.P.H)

Through a collaborative program between the VCU School of Social Work and the Division of Epidemiology in the VCU School of Medicine's Department of Family Medicine and Population Health, students complete a three-year full-time program of study, including summer course work, to obtain the Master of Social Work and Master of Public Health (p. 757) degrees. This dual-degree program prepares graduates to work with individuals, families, groups, communities and/or organizations; to advocate for social, health care and economic justice in a diverse and multicultural society; and to promote physical and mental health across the life course.

Application process

Prospective students are required to apply separately to both programs and meet both sets of admissions requirements. Once admitted, student and adviser will work together to develop a plan of study. It is preferable that students apply to both programs at the same time so that the structured dual-degree curriculum can be optimally planned. Students in one program may also apply to the second program during the first year of study. For more information, contact:

Sarah K. Price, Ph.D.
Professor, School of Social Work
skprice@vcu.edu
Phone: (804) 828-0579

Saba Masho, M.D., Dr.P.H.
Associate professor, Division of Epidemiology, Department of Family Medicine and Population Health
saba.masho@vcuhealth.org
Phone: (804) 628-2509

Graduate program director
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M.S.W. program director
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Phone: (804) 828-2007

Additional contact:
Caroline H. Shank
M.S.W. Program Coordinator
Email: chshank@vcu.edu
Phone: (804) 827-3412

Program website: socialwork.vcu.edu (http://www.socialwork.vcu.edu)

Social Work, Master of (M.S.W.)/ Aging Studies, Certificate in (Post-baccalaureate graduate certificate) [combined]

Program accreditation
Council on Social Work Education (M.S.W.)

The School of Social Work in cooperation with the Department of Gerontology of the College of Health Professions at VCU provides students with a unique educational opportunity in social work and gerontology. Master of Social Work students interested in work with elders or in gerontological programs may earn a Certificate in Aging Studies while completing the master's degree requirements.

In order to meet the requirements of the M.S.W. degree and the Certificate in Aging Studies, students complete a total of 65 graduate credit hours. All foundation and concentration courses of the Master of Social Work Program are completed, and core courses (nine credit hours) of the Certificate in Aging Studies Program are completed. Other requirements are met by (1) completion of M.S.W. research courses in which students undertake a project focused on aging, (2) completion of second-year field instruction practicum requirements (six credit hours) in a social work setting related to aging and (3) completion of an independent study course in gerontology, which integrates research and practicum courses.

See the individual program pages for specific admission requirements, application deadlines, program goals, student learning outcomes, degree requirements and graduation requirements for the M.S.W. and Certificate in Aging Studies degree programs.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Application process

Students must meet the admission requirements of the Master of Social Work program of the School of Social Work and of the Certificate in Aging Studies program in the Department of Gerontology. Admission into one program does not guarantee admission into the other.

Additional information may be obtained from the websites listed above or either of the following offices:

Virginia Commonwealth University
College of Health Professions
Department of Gerontology
P.O. Box 980228
Richmond, VA 23298-0228
Attention: M.S.W.-Gerontology Certificate Adviser

Virginia Commonwealth University
School of Social Work
P.O. Box 842027
Richmond, VA 23284-2027
Attention: M.S.W.-Gerontology Certificate Adviser

Curriculum requirements

Students must complete the M.S.W foundation curriculum or the advanced standing format and the concentration curriculum (either clinical practice or SWAPPP), including the following social work courses and the additional following courses from the Department of Gerontology. Six credit hours of GRTY courses will count toward the M.S.W. concentration electives.

Course	Title	Hours
GRTY 601	Biological and Physiological Aging	3
GRTY 602	Psychology of Aging	3
GRTY 603	Social Gerontology	3
GRTY 692	Independent Studies	2
Select one of the following:		6
SLWK 706 & SLWK 707	Research for Clinical Social Work Practice I and Research for Clinical Social Work Practice II	
SLWK 714 & SLWK 715	Research for Social Work Administration, Planning and Policy Practice I and Research for Social Work Administration, Planning and Policy Practice II	
Select one of the following:		6
SLWK 793 & SLWK 794	Concentration Field Instruction I and Concentration Field Instruction II	
SLWK 795	Concentration Block Field Instruction	
Total Hours		23

Graduate program director
Melissa D. Stewart, Ph.D.
M.S.W. program director
Email: mdstewart2@vcu.edu
Phone: (804) 828-2007

Graduate program director
Jennifer Pryor
Department of Gerontology
Email: pryorjm@vcu.edu
Phone: (804) 828-1565

Program websites: socialwork.vcu.edu (http://www.socialwork.vcu.edu) and chp.vcu.edu/gerontology (http://www.sahp.vcu.edu/gerontology)

Social Work, Master of (M.S.W.)/Gender Violence Intervention, Certificate in (Post-baccalaureate graduate certificate) [combined]

The combined Master of Social Work and Certificate in Gender Violence Intervention program is a collaborative effort among the L. Douglas Wilder School of Public Affairs, the School of Social Work and community advocates working in the area of sexual and domestic violence. The certificate requires a total of 15 credit hours.

To enroll in the Certificate in Gender Violence Intervention simultaneously with the M.S.W., students must complete a graduate application for the certificate program and pay the required fee to Graduate Admissions; however, no supporting information is required for students who are already enrolled in good standing in the M.S.W. program.

Applicants will need to complete an online admission application and select from the drop down menu "GVI Certificate." Applicants then pay

the application fee and attach an essay on why they wish to be in the program. Students should also indicate on the right-hand side of the admission application that they are currently in the M.S.W. program, which will alert the admissions office that the application can be sent directly to the program chair for an admissions decision.

Please arrange for references and transcripts to be forwarded to the Wilder School graduate studies office from the School of Social Work and they will be added to the admission application. **Students should indicate in the "Comments" section of the application form that they are already enrolled in the M.S.W. program.**

Additional information may be obtained from Virginia Commonwealth University, School of Social Work, Box 842027, Richmond, VA 23284-2027, Attention: Elizabeth Cramer, Ph.D., [ecramer@vcu.edu; (804) 828-9027], Certificate in Gender Violence Intervention Adviser. Detailed information about the Certificate in Gender Violence Intervention is available from Sarah Jane Brubaker, Ph.D., Wilder School [sbrubaker@vcu.edu; (804) 827-2400]. Certificate courses can be completed after M.S.W. degree requirements have been completed as long as there is continuous enrollment. All M.S.W. students interested in the certificate should check the course schedule for changes and other course offerings.

See the individual program pages for specific admission requirements, application deadlines, program goals, student learning outcomes, degree requirements and graduation requirements for the M.S.W. and Certificate in Gender Violence Intervention programs.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.W. and	Fall	Jul 15	
Post-baccalaureate graduate certificate	Spring	Nov 15	

Curriculum requirements

Course	Title	Hours
Required courses		
GVPA 623	Research Methods for Government and Public Affairs [1]	3
GVPA 635	Theorizing Gender Violence	3
GVPA 693	Internship [2]	3
PADM 650	Principles of Nonprofit Management [3]	3
SLWK 761	Interpersonal Violence	3
Total Hours		15

1

GVPA 623: satisfied by SLWK 706-SLWK 707 or SLWK 714-SLWK 715 [clinical or social work planning, administrative and policy practice research course (three credit hours)].

2

GVPA 693: satisfied by SLWK 693-SLWK 694, SLWK 695; or SLWK 793-SLWK 794, SLWK 795 [a social work field practicum in an agency providing sexual or domestic violence services (three credit hours)].

3

PADM 650: satisfied by SLWK 602-SLWK 606 (three credit hours).

Total graduate credit hours required (minimum) for the Certificate in Gender Violence Intervention for students in the M.S.W. program 15

Field placements

Once students are admitted and enrolled in the certificate program, they should consult the certificate adviser when they choose their field placements to ensure that at least one placement is conducted in a setting that addresses gender violence.

Graduate program directors
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Director, M.S.W. Program
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Phone: (804) 828-2007

Sarah Jane Brubaker, Ph.D.
Director, Gender Violence Intervention Program
Email: sbrubaker@vcu.edu
Phone: (804) 827-2400

Additional contact
Denia A. Lee-Hing, Ed.D.
Director of graduate studies, Wilder School
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program websites: socialwork.vcu.edu (http://socialwork.vcu.edu) and wilder.vcu.edu/academic/certificate/intervention.html (http://wilder.vcu.edu/academic/certificate/intervention.html)

Social Work, Master of (M.S.W.)/Nonprofit Management, Certificate in (Post-baccalaureate graduate certificate) [combined]

Through a cooperative arrangement with the L. Douglas Wilder School of Government and Public Affairs, Master of Social Work students pursuing the concentration in administration, planning and policy practice may simultaneously earn the post-baccalaureate graduate certificate in nonprofit management offered by the L. Douglas Wilder School of Government and Public Affairs.

Application process

To earn the Certificate in Nonprofit Management simultaneously with the M.S.W., it is necessary to complete a graduate admissions application for the certificate program; however, no supporting documents are required for students who are already enrolled in good standing in the M.S.W. degree program.

Certificate requirements for M.S.W. students

Social work students enrolled in the SWAPPP concentration are required to complete three nonprofit courses: PADM 656, PADM 659 and

PADM 661. Two social work SWAPPP courses are substituted for six credit hours of the certificate's 15 credit-hour requirement. One of these courses is SLWK 712. The second course may be SLWK 711 or SLWK 713.

Note: M.S.W. students pursuing the clinical concentration must complete the entire 15 credit hours required for the Certificate in Nonprofit Management. Any six of the PADM nonprofit credit hours will satisfy the M.S.W. elective requirement for either concentration.

See the individual program pages for specific admission requirements, application deadlines, program goals, student learning outcomes, degree requirements and graduation requirements for the stand-alone M.S.W. and Certificate in Nonprofit Management programs.

Curriculum requirements

Course	Title	Hours
PADM 656	Fund Development for the Nonprofit Sector	3
PADM 659	Financial Management for Nonprofit Organizations	3
PADM 661	Nonprofit Law, Governance and Ethics	3
SLWK 712	Social Work Planning and Administrative Practice I	3
SLWK 711	Strategies for Social Work Planning and Administrative Practice	3
or SLWK 713	Social Work Planning and Administrative Practice II	
Total Hours		15

Total graduate credit hours required (minimum) for the Certificate in Nonprofit Management for students in the M.S.W. program SWAPPP concentration 15

Graduate program director
Melissa D. Stewart, Ph.D.
M.S.W. program director
Email: mdstewart2@vcu.edu
Phone: (804) 828-2007

Myung Jin, Ph.D.
Program chair, Public Administration
Email: mhjin@vcu.edu
Phone: (804) 828-9813

Additional contact
Denia A. Lee-Hing, Ed.D.
Director of graduate studies, Wilder School
Email: dleehing@vcu.edu
Phone: (804) 827-1430

Program websites: socialwork.vcu.edu (http://www.socialwork.vcu.edu) and
wilder.vcu.edu/academic/certificate/nonprofit.html (http://www.wilder.vcu.edu/academic/certificate/nonprofit.html)

Public Health, Master of (M.P.H.)/Social Work, Master of (M.S.W.) [combined]

Program accreditation
Council on Education for Public Health (M.P.H.)
Council on Social Work Education (M.S.W.)

To qualify as a dual-degree student in any of the training paradigms which appear in the Bulletin, a student must have evidence of having been simultaneously enrolled in one or more courses of both of the programs constituting the "dual degree" for at least one semester.

Through a collaborative program between the VCU School of Social Work and the Division of Epidemiology in the School of Medicine's Department of Family Medicine and Population Health, students complete a three-year full-time program of study, including summer course work, to obtain the Master of Social Work and Master of Public Health degrees. The purpose of this dual-degree program is to prepare graduates to work with individuals, families, groups, communities and/or organizations; advocate for social, health care and economic justice in a diverse and multicultural society; and promote physical and mental health across the life course.

Prospective students are required to apply separately to both programs through the appropriate application portal indicated in the admission requirements section of this Bulletin and must meet both sets of admission requirements. Once admitted to both programs, the student is assigned an adviser from each to develop a plan of study, typically starting with the M.S.W. course work. It is preferable that students apply to both programs at the same time so that the structured dual-degree curriculum can be optimally planned. Students in one program may also apply to the second program during the first year of study.

Students are required to complete a minimum of 45 M.S.W. credit hours and a minimum of 36 M.P.H. credit hours, for a total of 81 semester credit hours. In the M.P.H. program, this includes 27 credit hours of core and required courses, a minimum six credit hours of elective courses and a minimum of three credit hours of a capstone project that examines a relevant public health topic. Note that some elective courses may not be available in certain years or may require instructor permission for registration. During the third and last year of study, dual-degree students are placed in internships through the School of Social Work that focus on public health; the internship placement is approved by both the M.P.H. program director and the director of the M.S.W. field instruction. With adviser approval, the student may develop a capstone project based on work in this public health/social work placement.

For the M.P.H., apply online at sophas.org (http://www.sophas.org) and submit a supplemental VCU application following instructions available at sophas.org**; for the M.S.W., apply online at** graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Please review the admission requirements for each stand-alone degree (Master of Public Health and Master of Social Work) in the VCU Graduate Bulletin to learn the specific application requirements for each program.

Curriculum requirements

Course	Title	Hours
Program core		
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
EPID 547	Applied Data Analysis Lab I	1.5
EPID 548	Applied Data Analysis Lab II	1.5
EPID 571	Principles of Epidemiology	3
EPID 580	Public Health Ethics	1

EPID 593	Foundations of the Public Health Profession	2
EPID 594	MPH Practicum	2
EPID 604	Principles of Environmental Health	3
EPID 694	MPH Capstone Project	3
HCPR 601	Introduction to Health Policy	3
IPEC 501	Foundations of Interprofessional Practice	1
SBHD 605	Introduction to Social and Behavioral Health	3
SLWK 601	Human Behavior in the Social Environment I	3
SLWK 602	Policy, Community and Organizational Practice I	3
SLWK 603	Social Work and Social Justice	3
SLWK 604	Social Work Practice with Individuals, Families and Groups I	3
SLWK 605	Social Work Practice with Individuals, Families and Groups II	3
SLWK 606	Policy, Community and Organizational Practice II	3
SLWK 609	Foundations of Research in Social Work Practice	3
SLWK 610	Human Behavior in the Social Environment II	3
SLWK 693	Foundation Field Instruction I	3
SLWK 694	Foundation Field Instruction II	3
Concentration courses		
Select one of the following concentrations:		9
M.S.W. clinical concentration:		
SLWK 703	Mental, Emotional and Behavioral Disorders	
SLWK 704	Clinical Social Work Practice I	
SLWK 705	Clinical Social Work Practice II	
M.S.W. SWAPPP concentration:		
SLWK 711	Strategies for Social Work Planning and Administrative Practice	
SLWK 712	Social Work Planning and Administrative Practice I	
SLWK 713	Social Work Planning and Administrative Practice II	
SLWK 793	Concentration Field Instruction I	3
SLWK 794	Concentration Field Instruction II	3
Additional program courses		
Electives		
Select a minimum of six graduate elective credits from the following:		6
BIOS 549	Spatial Data Analysis	
BIOS 571	Clinical Trials	
CCTR 630	Design Implications in Clinical Trials	
CCTR 631	Adaptive Clinical Trials	
EPID 600	Introduction to Public Health	
EPID 601	Contemporary Issues and Controversies in Public Health	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
EPID 622	Maternal and Child Health	
EPID 624	Chronic Disease Epidemiology	
EPID 646	Epidemiology of Psychiatric and Substance Use Disorders	
EPID 692	Independent Study	
GRAD 614	Introduction to Grant Writing	
GRTY 501	Physiological Aging	
GRTY 510	Aging	
GRTY 603	Social Gerontology	
GRTY 604	Problems, Issues and Trends in Gerontology	
HEMS 505	Contemporary Issues in Health	
HEMS 550	Exercise, Nutrition and Weight Management	
HEMS 604	Nutrition for Health and Physical Activity	
HEMS 605	Psychology of Physical Activity	
HEMS 606	Psychosocial Aspects of Sport and Physical Activity	
HGEN 501	Introduction to Human Genetics	
HGEN 502	Advanced Human Genetics	
HGEN 620	Principles of Human Behavioral Genetics	
HSEP 601	Emergency Management: Response Planning and Incident Command	
HSEP 603	Risk Assessment	
HSEP 650	Public Health Preparedness	
PSYC 660	Health Psychology	
SBHD 608	Health Communication	
SBHD 609	Research Methods in Social and Behavioral Health I	
SBHD 630	Theoretical Foundations of Social and Behavioral Health	
SBHD 632	Health Disparities and Social Justice	
SBHD 636	Community-based Participatory Research	
SBHD 637	Program Evaluation	
SBHD 638	Applications in Qualitative Research Methods	
SOCY 510	Domestic and Sexual Violence in Social Context	
SOCY 524	Aging and the Minority Community	
SOCY 603	Seminar in Population Studies	
SOCY 607	Seminar in Racial and Ethnic Relations in America	
SOCY 611	Studies in the Community	
SOCY 620	Seminar in Criminology	
SOCY 624	Community and Community Services for the Elderly	
SOCY 632	Intimate Partner and Sexual Violence: Medical Practice and Policy	
SOCY 633	Application of the Policy Process to Issues of Violence	

SOCY 634	Social Contexts of Childhood and Violence
SOCY 635	Theorizing Gender Violence
SOCY 645	The Sociology of Health and Illness
URSP 521	Introduction to Geographic Information Systems
URSP 621	Introduction to Geographic Information Systems
URSP 622	Community Socioeconomic Analysis Using GIS
URSP 625	Spatial Database Management and GIS Modeling
Noncurricular requirements	
In addition to course work, students must attend 12 public health seminars and complete 20 hours of community-based service-learning.	

Total graduate credit hours required (minimum) for combined M.P.H./M.S.W. 81

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, nature of research being conducted by a study, or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program directors
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(804) 828-9786

Sarah K. Price, Ph.D.
M.S.W./M.P.H. combined program coordinator
skprice@vcu.edu
(804) 828-0579

Additional contact
Lisa S. Anderson, M.P.H.
Director of educational programs, Division of Epidemiology, Department of Family Medicine and Population Health
lisa.s.anderson@vcuhealth.org
(804) 628-2512

Program websites: familymedicine.vcu.edu/epidemiology/mph/dual-degrees and socialwork.vcu.edu (http://www.socialwork.vcu.edu)

Ph.D. Program

Denise Burnette, Ph.D.
Professor and director
Email: jdburnette@vcu.edu
Phone: (804) 828-2859

The Ph.D. Program administers the curriculum that leads to the Doctor of Philosophy in Social Work.

• Social Work, Doctor of Philosophy (Ph.D.) (p. 838)

Social Work, Doctor of Philosophy (Ph.D.)

Program goals

VCU's Ph.D. in Social Work program is a research-oriented educational enterprise with a mission to develop scholars and leaders for education and practice in human services. Its vision is a program that builds and nurtures students' intellectual curiosity, creativity and courage, as well as their desire to "make a difference." The program is built around excellence in teaching, mentorship and socialization of students, as well as collaborative involvement in the program by its diverse faculty. Graduates of the program become active in teaching, consultation, research, practice and program evaluation, staff and program development, policy analysis and advocacy. They are employed in universities and colleges and in human service organizations and agencies at the local, state, national and international levels. In all the program's activities and events, emphasis is placed on the following areas:

1. The development of an intellectual community that values critical and creative thinking
2. The connections among the philosophy of science, theory, research and practice
3. The analysis and integration of knowledge and values, especially their relevance to diverse populations and issues of social justice

Student learning outcomes

1. A critical understanding of multiple paradigms in the philosophy of science and the implications of these for contemporary research
2. Mastery of a range of research methodologies and data analysis strategies and competence in conducting independent inquiry on issues of importance to the field
3. Competence in the analysis and application of a wide range of social, behavioral and practice theories
4. An ability to design and propose theoretically and empirically grounded models of social work intervention for coping with personal transitions and challenges, addressing social problems and promoting equity and social justice
5. A critical understanding of the historical place of social work and social welfare in the evolution of social thought and cultural values
6. Expertise in a chosen substantive area related to social work, including skills related to dissemination of this knowledge
7. Familiarity and beginning expertise about the exchange and dissemination of professional knowledge via submissions and presentations to meetings, journals and other professional outlets

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate

School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Comprehensive exam/admission to candidacy

Upon completion of all required course work, students are required to take a comprehensive exam under the supervision of a comprehensive examination committee. Through the comprehensive examination, students must demonstrate the ability to integrate the whole of their educational experience by adequately addressing complex questions pertinent to the current and developing knowledge base of the human service field. Students must register for a minimum of one credit hour of independent study (SWKD 792) in the semester in which they take the comprehensive examination.

Upon successful completion of all portions of the comprehensive exam, students are approved for degree candidacy and for registration for a minimum of one credit hour of dissertation research.

If one or more portions of the examination are not passed upon the first attempt, the student receives a mark of I in the independent study course and the following semester reattempts all (or portions) of the comprehensive examination one additional time. The grade of I is changed to A upon successful completion of the comprehensive exam on the second attempt and results in approval of degree candidacy and registration for dissertation research. If a student fails to pass all portions of the comprehensive examination a second time the grade of I is changed to F in the independent study course and the student is dismissed from the program. If a student chooses not to attempt the failed portion(s) of the comprehensive examination a second time, the grade of I is changed to F in the independent study course and the student is dismissed from the program.

Dissertation

After admission to candidacy, students proceed to propose, complete and defend their dissertations. The dissertation is completed under the supervision of a dissertation committee. A cumulative total of at least 15 credit hours of dissertation research must be completed in order to receive the Ph.D.; however, students may register for as many credits as needed/desired. Students are required to maintain continuous enrollment of at least three credit hours per semester (excluding summer) until they have attained 12 hours of dissertation credit, after which they may enroll for as few as one credit per semester. The dissertation must represent independent research and should be based on an original question or hypothesis relevant to social work. Successful defense of the dissertation, after the completion of 54 hours of course work and dissertation credits, completes the requirements for the degree.

Upon successful completion of the comprehensive examinations and entering candidacy, doctoral candidates enroll in SWKD 898 every fall and spring semester until graduation. Candidates must have successfully defended their dissertation proposal within four consecutive academic terms (fall and spring semesters), inclusive of the semester entering candidacy. Failure to have successfully defended the dissertation proposal within the time limit specified above will result in an unsatisfactory grade (U) in the fourth term of enrollment in SWKD 898. Failure to successfully defend the dissertation proposal by the end of the next fall or spring semester will result in another U grade in SWKD 898 and dismissal from the program. The semester limits noted above for successfully defending the dissertation proposal are in effect whether a candidate is actively matriculated or on a leave of absence.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall only	Jan 15	GRE-General

Special requirements

- Submit all additional application materials (personal statement, reference letters, writing sample and resume/curriculum vita) through the Graduate Admissions Office. If desired, an additional copy may be sent directly to the School of Social Work c/o Leslie Choplin, Ph.D., program assistant.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must meet the following minimum requirements.

Applicants to the program must have an earned master's degree in social work or a closely related discipline, as well as professional experience relevant to their career goals. The relationship between the applicants' professional experiences and their career objectives should be clearly articulated in the personal statements submitted with the application materials.

Applicants whose career goals include teaching in a bachelor's- and/or master's-level social work program should be aware that an M.S.W. degree and social work practice experience, along with the Ph.D., are often considered to be minimal job requirements. In addition, Council on Social Work Education accreditation standards currently require that individuals who want to teach practice courses, in particular, must have an M.S.W. and at least two years of post-M.S.W. practice experience.

The Graduate Record Examination (General Test including verbal, quantitative and analytic sections) is required. There is no minimum threshold for acceptance. Applicants are strongly advised to take the examination by December to ensure scores are received by the priority application date of Jan. 15. For more information on the GRE, visit gre.org (https://www.ets.org/gre). The institution code for VCU is 5570.

The normal course of study is full-time. While it is possible, in some cases, to combine a limited amount of course work with outside employment, all students must complete at least one year of full-time study prior to admission to candidacy.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must meet the following requirements.

A minimum of 54 graduate credit hours is required, which comprises 27 hours of core course work common for all students, nine credit hours of electives selected individually to suit the student's course of study, three credit hours of directed research and a minimum of 15 credit hours of dissertation research. The Graduate School requirements for candidacy exams and dissertation committees apply to students in this program. Up to six credit hours may be granted for courses completed at another university. Full-time students ordinarily complete 18 to 20 credit hours per academic year.

The Ph.D. curriculum is designed for students to specialize in a substantive area and increase their relevant research skills. Students take three hours of directed research (SWKD 797) in preparation for their independent dissertation research and nine hours of elective credit, which includes three credit hours of advanced statistics and/or research courses, and another six credit hours of elective courses or independent study customized to their areas of interest. In addition to elective courses offered by the program, students may enroll in appropriate courses in other schools and departments at VCU with approval of their advisers. A minimum of 39 credit hours of course work, as outlined above, is required before admission to candidacy.

Curriculum requirements

Core curriculum

Course	Title	Hours
SWKD 701	Quantitative Research Methods	3
SWKD 702	Quantitative Data Analysis	4
SWKD 703	Philosophical Issues in Social Work Knowledge Building	3
SWKD 704	Multiparadigmatic Qualitative Methods and Analysis	4
SWKD 705	Multivariate Analysis in Social Work and Human Services Research	3
SWKD 708	Social Science Foundations for Social Work	3
SWKD 710	Social Work, Social Welfare and Social Thought	3
SWKD 715	Development and Evaluation of Social Work Practice Theories and Models	3
SWKD 798	Intergrative Seminar	1
Total Hours		27

Electives

Course	Title	Hours
Advanced statistics and/or research courses		
Select one of the following:		3
BIOS/STAT 513	Mathematical Statistics I	
BIOS/STAT 514	Mathematical Statistics II	
BIOS 553	Biostatistical Methods I	
BIOS 554	Biostatistical Methods II	
BIOS 571	Clinical Trials	
BIOS 572	Analysis of Biomedical Data I	
BIOS 625	Categorical Data Analysis and Generalized Linear Models	
BIOS 631	Mixed Models and Longitudinal Data Analysis	
BIOS 647	Survival Analysis	
BIOS 688	Applied Bayesian Biostatistics	
EPID 651	Intermediate Epidemiologic Methods for Research	
EPID 652	Advanced Epidemiologic Methods and Data Analysis	
SBHD 633	Structural Equation Modeling	
SBHD 636	Community-based Participatory Research	
STAT 546	Linear Models	
STAT/BIOS 621	Nonparametric Statistical Methods	
STAT 626	Complex Sampling Designs and Variance Estimation	
STAT 642	Design and Analysis of Experiments I	
STAT 643	Applied Linear Regression	
STAT 675	Time Series Analysis I	
STAT 744	Regression II	
SWKD 722	Evaluation of Human Service Programs	
SWKD 724	Constructivist Inquiry	
SWKD 791	Topical Seminar	
URSP 621	Introduction to Geographic Information Systems	
URSP 622	Community Socioeconomic Analysis Using GIS	
Additional elective courses or independent study		
Select an additional six credits customized to student's area of interest		6
Total Hours		9

In addition to elective courses offered by the program, students may enroll in appropriate courses in other schools and departments at VCU with approval of their advisers. Outside elective courses may be selected from classes at the 500 level or higher in BIOS, CCTR, CMSC, CLED, CRJS, ECSE, ECON, EDUS, ENVS, EPID, GSWS, GRTY, GVPA, GRAD, HADM, HCPR, HSEP, HGEN, HUMS, INFO, IDAS, IDDS, MASC, MATX, NURS, OVPR, PHAR,

PSYC, PADM, PPAD, SBHD, SLWK, SWKD, SOCY, SEDP, STAT, SYSM, TEDU AND USRP.

Research

Course	Title	Hours
SWKD 797	Directed Research	3
SWKD 898	Dissertation Research (a minimum of 15 credits)	15
Total Hours		18

Total graduate credit hours required (minimum) 54

Graduate program director
Denise Burnette, Ph.D.
Professor and Samuel S. Wurtzel Endowed Chair in Social Work
Email: jdburnette@vcu.edu
Phone: (804) 828-2859

Additional contact
Leslie Choplin, D.Ed.Min.
Ph.D. program assistant
Email: lachoplin@vcu.edu
Phone: (804) 828-1044

Program website: socialwork.vcu.edu (http://www.socialwork.vcu.edu)

VCU LIFE SCIENCES

VCU entered a new era when it implemented, as one of its highest priorities, a new universitywide matrix academic organization called VCU Life Sciences, created in response to the need to prepare students for the anticipated growth in new life sciences jobs in the coming decades. The skills identified for these jobs require highly interdisciplinary or multidisciplinary approaches, often falling between the boundaries of traditional academic disciplines. The way that the life sciences are understood and taught is likely to be fundamentally different, with increasing emphasis on systems biosciences as an important complement to more traditional, purely reductive approaches. The objective of Phase II of VCU's strategic plan specifically outlines the need to bring VCU's major academic and administrative divisions together to work on mutual initiatives that will accomplish VCU's goal of national leadership. VCU Life Sciences is a response to that objective.

Faculty

VCU Life Sciences faculty members are drawn from departments across the university. Lists of participating faculty and academic affiliations are available on the VCU Life Sciences website (http://www.vcu.edu/lifesci) for each program.

Facilities

VCU Life Sciences comprises the resources and interests not only of the Monroe Park Campus and the VCU Medical Center, but also the Virginia BioTechnology Research Park (http://www.vabiotech.com) and the Inger and Walter Rice Center for Environmental Life Sciences (http://www.vcu.edu/rice), a property of 342 acres overlooking the James River in Charles City County. The $27 million Eugene P. and Lois E. Trani Center for Life Sciences houses administrative offices, the Center for Environmental Studies, state-of-the-art laboratories and classrooms, and a climate-controlled greenhouse. The Center for the Study of Biological Complexity, including the Center for High Performance Computing at VCU, is housed in Grace E. Harris Hall.

VCU Life Sciences supports two university centers for its research and teaching efforts: the Center for Environmental Studies (http://www.vcu.edu/cesweb) and the Center for the Study of Biological Complexity (http://www.vcu.edu/csbc).

Administration

1000 West Cary Street
Box 842030
Richmond, Virginia 23284-2030
Phone: (804) 827-5600
Fax: (804) 828-1961
vcu.edu/lifesci (http://www.vcu.edu/lifesci)

Robert M. Tombes, Ph.D.
Vice provost for life sciences

Michael S. Rosenberg, Ph.D.
Director, Center for the Study of Biological Complexity

Herschell S. Emery, Ph.D.
Director of undergraduate curricula

Rodney J. Dyer, Ph.D.
Director, Center for Environmental Studies

Brian Verrelli, Ph.D.
Director, Ph.D. in Integrative Life Sciences program

Graduate information

Transfer credit

Graduate-level course work completed prior to matriculation into the program, including course work taken in another program at VCU or at another institution, shall be evaluated to determine whether it can be used to fulfill degree requirements of this program. There is no limit to the number of credits that can be transferred from another program at VCU as long as they have not been previously applied toward another degree. A maximum of six credit hours earned at an institution other than VCU can be accepted for transfer into the program if not previously applied toward another degree. A minimum grade of B is required for transfer of credits.

Grade requirements

Degree candidates must maintain a minimum GPA of 3.0. GPAs shall be based on all graduate courses attempted after acceptance into the program. The academic standing of any student who receives multiple grades of C, or a grade of D or F, will be reviewed for possible termination from the program.

Center for Environmental Studies

Rodney J. Dyer, Ph.D.
Director

James R. Vonesh, Ph.D.
Assistant Director

Stephen P. McIninch, Ph.D.
Director for graduate studies

Lindsay Freeman
Undergraduate adviser
envsadvising@vcu.edu

ces.vcu.edu (http://ces.vcu.edu)

The undergraduate and graduate programs in environmental studies are interdisciplinary in nature, exposing students to the critical links between the areas of environmental life sciences, technology and policy.

At the undergraduate level, students gain the necessary skills for entry-level field and research positions. Class lectures and guest speakers introduce the importance of policy-making and awareness in the environmental field, while laboratory and internship experiences provide a working knowledge of the latest in environmental technology and field practices.

The graduate programs provide two options for students to further their studies in the environmental life sciences. The Master of Science in Environmental Studies is a thesis-based program designed for those individuals interested pursuing research in the environmental field. The Master of Environmental Studies (the non-thesis program) is a terminal, two-year professional degree for individuals working in the private/public sector of the environmental field.

- Environmental Studies, Master of (M.Envs.) (p. 843)
- Environmental Studies, Master of (M.Envs.), accelerated Bachelor of Science in Environmental Studies (B.S.) to master's (p. 844)
- Environmental Studies, Master of Science (M.S.) (p. 847)

Environmental Studies, Master of (M.Envs.)

Program goal

The goal of the Master of Environmental Studies (M.Envs.) degree program is to provide an interdisciplinary master's degree program in environmental studies that emphasizes the critical links between environmental life sciences and public policy. This goal necessitates training that crosses disciplinary boundaries. Through a program of study combining environmental science, environmental technology and environmental policy, the successful graduate will gain a range of skills designed to facilitate a science-based understanding of the natural world and human interactions with it. The M.Envs. is specifically designed to provide students with professional training to prepare them for careers involving leadership in environmental science and policy.

Student learning outcomes

1. Graduates will be able to use emerging environmental technologies and apply them under real-world conditions.
2. Graduates will be able to conduct objective research and/or interpret research findings, and apply scientific concepts and information to the decision-making process for environmental regulations and policies.
3. Graduates will be able to effectively bridge the realms of policy and science on critical environmental issues and be able to make significant contributions in an interdisciplinary professional and academic environment.
4. Graduates will possess a sophisticated and practical understanding of methods for collection, analysis, presentation and critical interpretation of environmental data using appropriate statistical and quantitative tools.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Envs. (non-thesis degree)	Fall	Jul 1	GRE
	Spring	Dec 1	TOEFL for international students
	Summer	May 1	

Special requirements

- For students seeking fall admission, preference is given to applications received before March 15. Students wishing to be considered for funding must apply by April 1.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree from an accredited institution reflecting ability to perform at the graduate level.

While qualified students from any baccalaureate program will be considered for admission to the M.S., due to the program goal of linking science and policy, students with narrow training in one field or the other may be required to complete some basic education in the alternate field prior to full admission.

Students admitted to the program are generally drawn from applicants with a minimum undergraduate GPA of 3.0 (on a 4.0 scale or equivalent) and satisfactory scores on a current standardized graduate admissions test (normally the GRE). Applicants holding an undergraduate degree from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 600 on the TOEFL paper-based examination or 100 on the Internet-based examination.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 33 graduate credit hours, approved by the program director, with an overall minimum GPA of 3.0 on all graduate course work attempted after acceptance into the program (At least one-half of required course work must be at the 600 level or higher.)
2. Complete three required core courses (9 credit hours)
3. Complete an additional 21 credit hours of approved graduate electives
4. Complete 3 credit hours of practical experience (either 3 credit hours of internship or independent study)
5. Successfully complete a comprehensive oral examination administered by three faculty members

Curriculum requirements

Core requirements

Course	Title	Hours
ENVS 601	Survey in Environmental Studies	3
ENVS 603	Environmental Research Methods	3
STAT 543	Statistical Methods I	3
Practical experience		
Select three credit hours from the following: [1]		3
ENVS 692	Independent Study	
ENVS 693	Internship in Environmental Studies	
Select courses from electives list below [2]		21
Total Hours		33

1

Students may not apply more than a total of 3 credits of ENVS 692 and/or ENVS 693 to the degree without prior approval of the major adviser and program director.

2

Courses must represent at least two of the disciplines below. Listed courses are options and are not comprehensive of all electives. Other electives may be allowed with prior permission of major adviser and program director.

Electives

Course	Title	Hours
Environmental studies		
ENVS 550	Ecological Risk Assessment	3
ENVS/ANTH 556	Historical and Cultural Landscapes	3
ENVS 692	Independent Study	1-3
ENVS 693	Internship in Environmental Studies	1-3
Environmental policy and administration		
ENVS/PADM 628	Environmental Policy and Administration	3
ENVS 660	Virginia Environmental Law	3
PADM 601	Principles of Public Administration	3
URSP 650	Natural Resources and Environmental Planning	3
URSP 652	Environmental Analysis	3
Environmental science/health		
BIOL 510	Conservation Biology	3
BIOL 514	Stream Ecology	4
BIOL 532	Water Pollution Biology	3
BIOL 591	Special Topics in Biology (applied and environmental microbiology)	1-4
ENVS 650	Pesticides, Health and the Environment	3
ENVS 655	Hydrogeology	3
ENVS 670	Pollution Physiology	3
Environmental technology		
ENVS/URSP 521	Introduction to Geographic Information Systems	3
ENVS 602	Environmental Technology	1-3
ENVS/URSP 654	Environmental Remote Sensing	3
ENVS 691	Topics in Environmental Studies (environmental applications of GIS)	1-3

Total number of graduate credit hours required (minimum) 33

Graduate program director

Stephen P. McIninch, Ph.D.
Professor, Center for Environmental Studies
spmcinin@vcu.edu
(804) 828-7202

Program website: vcu.edu/cesweb (http://vcu.edu/cesweb)

Environmental Studies, Master of (M.Envs.), accelerated Bachelor of Science in Environmental Studies (B.S.) to master's

Program goal

The goal of the Master of Environmental Studies (M.Envs.) degree program is to provide an interdisciplinary master's degree program in environmental studies that emphasizes the critical links between environmental life sciences and public policy. This goal necessitates training that crosses disciplinary boundaries. Through a program of study combining environmental science, environmental technology and environmental policy, the successful graduate will gain a range of skills designed to facilitate a science-based understanding of the natural world and human interactions with it. The M.Envs. is specifically designed to provide students with professional training to prepare them for careers involving leadership in environmental science and policy.

Student learning outcomes

1. Graduates will be able to use emerging environmental technologies and apply them under real-world conditions.

2. Graduates will be able to conduct objective research and/or interpret research findings, and apply scientific concepts and information to the decision-making process for environmental regulations and policies.
3. Graduates will be able to effectively bridge the realms of policy and science on critical environmental issues and be able to make significant contributions in an interdisciplinary professional and academic environment.
4. Graduates will possess a sophisticated and practical understanding of methods for collection, analysis, presentation and critical interpretation of environmental data using appropriate statistical and quantitative tools.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.Envs. (non-thesis degree)	Fall		TOEFL required for international students
	Spring		
	Summer		

The accelerated Bachelor of Science and Master of Environmental Studies is restricted to students who have demonstrated strong interest and success in environmental studies. The minimum qualification for admittance to the program is the completion of 90 undergraduate credit hours with an overall GPA of 3.0 and a GPA of 3.3 in the environmental studies major concentration. Students also are required to provide a letter of recommendation from at least one of their major professors attesting to their interest and competence in environmental studies.

Students may apply to the accelerated program after completing a total of 70 credit hours, either by transfer or VCU completion. Students begin accelerated graduate classes after completing a total of 90 undergraduate credits, either by transfer or VCU completion.

Special admission requirements

Students failing to meet the minimum standards for admission to the accelerated program due to exceptional circumstances will be allowed to appeal to the environmental studies graduate admissions committee for special admission. However, under no circumstances will students who fail to meet the graduate student standards of performance outlined in the Graduate Bulletin be admitted to the accelerated program.

The environmental studies undergraduate and graduate studies program directors jointly will provide guidance for students who are accepted into the accelerated program. This guidance will include a review of all of the program degree requirements, both graduate and undergraduate, and the development of an appropriate plan of study.

Degree requirements

The requirements for the B.S. in Environmental Studies and the Master of Environmental Studies are not reduced by the accelerated program. However, 12 credit hours of graduate course work may be applied toward both degrees for qualified students in the program.

Refer to the VCU Undergraduate Bulletin for a complete listing of requirements for the B.S. in Environmental Studies (http://bulletin.vcu.edu/undergraduate/vcu-life-sciences/center-environmental-studies/environmental-studies-bs/#degreerequirementstext) degree program. The following table outlines the undergraduate requirements that would be fulfilled by the corresponding graduate courses. Where special circumstances exist (e.g., student has already completed a fulfilled course prior to applying to the accelerated program), another undergraduate requirement may be fulfilled by the listed graduate course

with the approval of both the graduate and undergraduate program directors.

Shared credits

Shared graduate class	Undergraduate requirements fulfilled	Credits
ENVS 550 or ENVS 670	ENVS 330	3
ENVS 601	SOCY 320/POLI 320	3
ENVS elective (approved graduate electives; see table below)	ENVS elective	3
STAT 543	STAT 314	3

Total number of shared graduate credit hours 12

Approved graduate electives

Course	Title	Hours
ENVS/URSP 521	Introduction to Geographic Information Systems	3
ENVS 591	Topics in Environmental Studies	1-3
or ENVS 691	Topics in Environmental Studies	
ENVS 602	Environmental Technology	1-3
ENVS/PADM 628	Environmental Policy and Administration	3

Following the completion of the undergraduate requirements, the student may complete the master's degree within one year. The recommended approach would be to complete the hands-on component of the degree (internship or independent study) during the summer following completion of the undergraduate requirements. All additional requirements could then be completed in two nine-hour semesters. However, students may also opt to postpone the hands-on component of the degree until the summer following the completion of all graduate course work.

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 33 graduate credit hours, approved by the program director, with an overall minimum GPA of 3.0 on all graduate course work attempted after acceptance into the program (At least one-half of required course work must be at the 600 level or higher.)
2. Complete three required core courses (9 credit hours)
3. Complete an additional 21 credit hours of approved graduate electives
4. Complete 3 credit hours of practical experience (either 3 credit hours of internship or independent study)
5. Successfully complete a comprehensive oral examination administered by three faculty members

Curriculum requirements

Core requirements

Course	Title	Hours
ENVS 601	Survey in Environmental Studies	3
ENVS 603	Environmental Research Methods	3
STAT 543	Statistical Methods I	3
Practical experience		
Select three credit hours from the following: [1]		3
ENVS 692	Independent Study	
ENVS 693	Internship in Environmental Studies	
Select courses from electives list below [2]		21
Total Hours		33

[1]Students may not apply more than a total of three credits of ENVS 692 and/or ENVS 693 to the degree without prior approval of the major adviser and program director.

[2]Courses must represent at least two of the disciplines below. Listed courses are options and are not comprehensive of all electives. Other electives may be allowed with prior permission of major adviser and program director.

Electives

Course	Title	Hours
Environmental studies		
ENVS 550	Ecological Risk Assessment	3
ENVS/ANTH 556	Historical and Cultural Landscapes	3
ENVS 692	Independent Study	1-3
ENVS 693	Internship in Environmental Studies	1-3
Environmental policy and administration		
ENVS/PADM 628	Environmental Policy and Administration	3
ENVS/GVPA 640	River Policy	3
ENVS 660	Virginia Environmental Law	3
PADM 601	Principles of Public Administration	3
URSP 650	Natural Resources and Environmental Planning	3
URSP 652	Environmental Analysis	3
Environmental science/health		
BIOL 510	Conservation Biology	3
BIOL 514	Stream Ecology	4
BIOL 532	Water Pollution Biology	3
BIOL 591	Special Topics in Biology (applied and environmental microbiology)	1-4
ENVS 650	Pesticides, Health and the Environment	3
ENVS 655	Hydrogeology	3
ENVS 670	Pollution Physiology	3
Environmental technology		
ENVS/URSP 521	Introduction to Geographic Information Systems	3
ENVS 602	Environmental Technology	1-3
ENVS/URSP 654	Environmental Remote Sensing	3
ENVS 691	Topics in Environmental Studies (environmental applications of GIS)	1-3

Total number of graduate credit hours required (minimum) 33

Graduate program director

Stephen P. McIninch, Ph.D.
Professor, Center for Environmental Studies
spmcinin@vcu.edu
(804) 828-7202

Program website: vcu.edu/cesweb (http://vcu.edu/cesweb)

Environmental Studies, Master of Science (M.S.)

Program goal

The goal of the M.S. in Environmental Studies is to provide an interdisciplinary master's degree program in environmental studies that emphasizes the critical links between environmental life sciences and public policy. This goal necessitates training that crosses disciplinary boundaries. Through a program of study combining environmental science, environmental technology and environmental policy, the successful graduate will gain a range of skills designed to facilitate a science-based understanding of the natural world and human interactions with it. The M.S. is specifically designed to prepare students for careers involving science and policy research through the completion of a culminating thesis project.

Student learning outcomes

1. Graduates will be able to use emerging environmental technologies and apply them under real-world conditions.
2. Graduates will be able to conduct objective research and/or interpret research findings, and apply scientific concepts and information to the decision-making process for environmental regulations and policies.
3. Graduates will be able to effectively bridge the realms of policy and science on critical environmental issues and be able to make significant contributions in an interdisciplinary professional and academic environment.
4. Graduates will possess a sophisticated and practical understanding of methods for collection, analysis, presentation and critical interpretation of environmental data using appropriate statistical and quantitative tools.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE
	Spring	Dec 1	TOEFL required for international students
	Summer	May 1	

Special requirements

- For students seeking fall admission, preference is given to applications received before March 15. Students wishing to be considered for funding must apply by April 1. See program website (http://www.vcu.edu/cesweb).

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants must have successfully completed undergraduate training and hold a bachelor's degree from an accredited institution reflecting ability to perform at the graduate level.

While qualified students from any baccalaureate program will be considered for admission to the Master of Science in Environmental Studies (M.S.) program, due to the program goal of linking science and policy, students with narrow training in one field or the other may be required to complete some basic education in the alternate field prior to full admission. Moreover, admission to the M.S. program requires a sponsoring faculty adviser, who will function as a thesis adviser for the admitted student. Students without such sponsorship will be considered for admission to the Master of Environmental Studies (M.Envs.) degree program. If an appropriate adviser is identified following admission, the student's program may be changed to the M.S. program.

Students admitted to the program are generally drawn from applicants with a minimum undergraduate GPA of 3.0 (on a 4.0 scale or equivalent) and satisfactory scores on a current standardized graduate admissions test (normally the GRE). Applicants holding an undergraduate degree from recognized foreign institutions should display an acceptable level of English proficiency by achieving a minimum score of 600 on the TOEFL paper-based examination or 100 on the Internet-based examination.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete a minimum of 33 graduate credit hours, approved by the program director, with an overall minimum GPA of 3.0 on all graduate course work attempted after acceptance into the program (At least one-half of required course work must be at the 600 level or higher).
2. Complete three required core courses (9 credit hours)
3. Complete an additional 18 credit hours of approved graduate electives
4. Develop a research proposal approved by a committee of three faculty members
5. Qualify for degree candidacy based upon satisfactory completion of the above requirements
6. Complete the proposed research culminating in a publication-quality thesis (6 research credit hours)
7. Successfully defend the research thesis

Curriculum requirements

Course	Title	Hours
Core requirements		
ENVS 601	Survey in Environmental Studies	3
ENVS 603	Environmental Research Methods	3
STAT 543	Statistical Methods I (or equivalent)	3
Thesis		
Select a maximum of six credit hours from the following (M.S. degree only):		6
ENVS 697	Research	
ENVS 698	Thesis	
Electives		
Select from electives below [1]		18
Total Hours		33

[1]

Courses must represent at least two of the disciplines below. Listed courses are options and are not comprehensive of all electives. Other electives may be allowed with prior permission of major adviser and program director.

Electives

Course	Title	Hours
Environmental studies		
ENVS 550	Ecological Risk Assessment	3
ENVS/ANTH 556	Historical and Cultural Landscapes	3
ENVS 692	Independent Study [1]	1-3
ENVS 693	Internship in Environmental Studies [1]	1-3
Environmental policy and administration		
ENVS/PADM 628	Environmental Policy and Administration	3
ENVS/GVPA 640	River Policy	3
ENVS 660	Virginia Environmental Law	3
PADM 601	Principles of Public Administration	3
URSP 650	Natural Resources and Environmental Planning	3
URSP 652	Environmental Analysis	3
Environmental science/health		
BIOL 510	Conservation Biology	3
BIOL 514	Stream Ecology	4
BIOL 532	Water Pollution Biology	3
BIOL 591	Special Topics in Biology (applied and environmental microbiology)	1-4
ENVS 650	Pesticides, Health and the Environment	3
ENVS 655	Hydrogeology	3
ENVS 670	Pollution Physiology	3
Environmental technology		
ENVS/URSP 521	Introduction to Geographic Information Systems	3
ENVS 602	Environmental Technology	1-3
ENVS/URSP 654	Environmental Remote Sensing	3
ENVS 691	Topics in Environmental Studies (environmental applications of GIS)	1-3

[1]

Students may not apply more than three credit hours (total) of ENVS 692 and/or ENVS 693 to the degree without prior approval of the major adviser and program director.

Total number of graduate credit hours required (minimum) 33

Graduate program director
Stephen P. McIninch, Ph.D.
Professor, Center for Environmental Studies
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(804) 828-7202

Program website: vcu.edu/cesweb (http://vcu.edu/cesweb)

Center for the Study of Biological Complexity

Michael S. Rosenberg, Ph.D.
Director

csbc.vcu.edu (http://csbc.vcu.edu)

The Center for the Study of Biological Complexity is a multidisciplinary focus of research and scholarly activity within VCU Life Sciences. The mission of the center is to apply the principles of complexity to contemporary biological problems in all aspects of research and scholarly activity, supporting research in integrative molecular, cellular and developmental biology.

- Bioinformatics, Master of Science (M.S.) (p. 849)
- Bioinformatics, Master of Science (M.S.), accelerated Bachelor of Science in Bioinformatics (B.S.) to master's (p. 852)

Bioinformatics, Master of Science (M.S.)

Program goals

The VCU Center for the Study of Biological Complexity created and administers the Master of Science in Bioinformatics degree program to provide interested students with two options:

1. A traditional "thesis master's," including the development, implementation, writing and presentation of a coherent research project under the supervision of a graduate faculty member. This degree is most appropriate for students committed to initiating research careers in a variety of settings, including students considering pursuing later work toward a Ph.D.
2. A "professional science master's" option, with project-oriented research, including completion of a 10- to 12-week full-time externship in an industrial, government or academic site, usually during the summer between the first and second years of the bioinformatics program. This degree is most appropriate for students who wish to work in industrial/commercial settings.

Students enter the program from a variety of academic backgrounds (biology, chemistry, computer science, mathematics/statistics, etc.) assisted by flexible "bridge curricula" designed to help them meet program prerequisites. Students will have an effective exposure to the biotech industry and other career options and to real-life applications of their learning.

The Master of Science in Bioinformatics degree program will prepare students to:

1. **Synthesize and apply interdisciplinary subject matter:** The M.S. in Bioinformatics degree program seeks to provide students with the skills and knowledge required to advance into Ph.D. training programs and research positions in universities, government labs or industry. The program provides a framework for the progressive development of a mastery of the interdisciplinary subject matter pertinent to bioinformatics and an ability to synthesize this information and apply it to key areas of investigation and experimentation in bioinformatics.
2. **Design, implement and interpret experimental approaches:** The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches.
3. **Develop communication skills:** In addition, the program will develop skills in oral and written communication of interdisciplinary science concepts, experimental design, results and interpretation.

Student learning outcomes

1. **Oral communication skills:** The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. **Written communication skills:** The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information, including the use of figures, tables and citations, as measured by rubric.
3. **Experimental design competency:** The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify, and/or create and implement bioinformatics experimental protocols and to design and develop experiments, as measured by rubric.
4. **Problem-solving skills:** The candidate will demonstrate an appropriate level of ability to analyze scientific problems including pertinent datasets and design and develop appropriate methods to solve said problems, as measured by rubric.
5. **Integrated knowledge of bioinformatics:** The candidate will demonstrate an appropriate level of knowledge of fundamentals of molecular biology, computational science, statistics and a more detailed understanding of an individual area of internship research, including an appropriate familiarity with the research literature, as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

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Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE
	Spring	Nov 15	
	Summer	May 1	

Special requirements

- International students requiring temporary U.S. visas should apply by April 1 for fall admission, Oct. 1 for spring admission or Feb. 1 for summer admission.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants are encouraged to include in their personal statements, and request that their referees also discuss, one or more examples of creative and analytical contributions they have made to a recent research project (preferred) or to a challenging course assignment.

Because of the interdisciplinary nature of bioinformatics, applications are welcomed from students with various academic backgrounds, such as biology, biotechnology, molecular biology, computer science, mathematics or statistics. Our program provides “bridge curricula” to strengthen students’ preparation for graduate study in bioinformatics.

Degree requirements

Prerequisites and bridge curricula for master’s programs

While an ideal preparation for the bioinformatics master’s programs would include substantial work in molecular biology, computer science, mathematics and statistics, the program has been designed to provide “bridge curricula” to accommodate academically strong students with majors in any one of these or related disciplines. These students would develop with the assistance of their advisers a “bridge curriculum” of largely undergraduate courses to meet the prerequisites for the program and prepare them for graduate-level work.

Program prerequisites are listed below. In general, students will not need to address the set corresponding to their undergraduate majors, but will usually need to address the other two sets. It is expected that all bridge course work will be completed during the first year. While bridge courses may be completed prior to initiating the graduate program, this is not required, and most students are able, through advising, to complete bridge courses alongside graduate course work during the first year of the program.

1. **Biology/genomic prerequisites:** an introductory knowledge of biochemistry and molecular biology, one semester of organic chemistry (e.g. CHEM 301), cell biology (e.g.BIOL 300) and an undergraduate course in molecular biology
2. **Computational science prerequisites:** an introductory knowledge of discrete mathematics (e.g. MATH 211) and an introductory knowledge of computer science, including at least one general computer programming language, met by taking structured programming (e.g. CMSC 255) and data structures and advanced programming (e.g. CMSC 256)
3. **Quantitative/statistical prerequisites:** an introductory knowledge of mathematics/statistics, met by taking calculus I (e.g. MATH 200) and at least one undergraduate course in statistics

Thesis research

In addition to general VCU Graduate School graduation requirements (p. 31), students in the M.S. program must perform a credible original investigation under the supervision of their major advisers and the Graduate Advisory Committee. Students must develop and write short proposals in consultation with their major advisers and GAC. The project must be approved by the student’s GAC, based on a short (10-page) paper submitted by the student. This paper will include background on the project, including a review of the literature, the purpose, specific aims and rationale of the project, a statement about the specific hypothesis to be investigated, and proposed methods and statistical analyses.

Research projects will be based on ongoing research in the laboratories of faculty in the CSBC and across both campuses of VCU and the Virginia BioTechnology Research Park. Students in the program may perform research on the broad range of subjects, from molecules to ecosystems, studied by CSBC faculty.

Students shall prepare a written thesis describing the completed research performed during their tenure in the M.S. in Bioinformatics program following the format of the Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf). An oral defense, consisting of a public presentation of the thesis and a committee meeting to discuss the thesis, under the direction of the GAC but open to all faculty members, shall be scheduled to examine the student’s research, thesis and underlying fundamental knowledge of the discipline encompassed by the student’s research. Announcement of the oral defense, including the candidate’s name, thesis title and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Non-thesis (professional science master’s) externship

In addition to general VCU Graduate School graduation requirements (p. 31), students enrolled in the non-thesis, professional science master’s option complete a 10- to 12-week full-time externship at an industrial, government or academic site, usually during the summer between the first and second years of the bioinformatics program. In preparation for this externship, students will enroll in BNFO 620 and BNFO 621 in the semester preceding their externships. Upon initiating the externship, each student must develop and write a short proposal or prepare a PowerPoint presentation outlining the plans for the externship for review by the student’s GAC. Research projects will be based on ongoing research in the laboratories of the participating external advisers. Students in the program may perform computational research on a broad range of subjects, from molecules to ecosystems, encompassing the field of bioinformatics.

In the semester following the externship experience, non-thesis students shall prepare written papers (~10 pages) describing the completed research performed during their externships following the format of the Graduate School’s Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf). The paper

should include background on the project, including a review of the literature, the purpose, specific aims and rationale of the project, the specific hypotheses investigated, description of the methods and statistical analyses implemented, results, discussion/conclusions, and a bibliography. An oral defense, consisting of a public presentation of the paper and a committee meeting to discuss the results, under the direction of the GAC but open to all faculty members and the adviser of the externship, shall be scheduled to examine the student's underlying fundamental knowledge of the disciplines encompassed by the student's externship. Announcement of the oral defense, including the candidate's name, project title, and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Curriculum requirements

Thesis option

Course	Title	Hours
Core		
BIOL/BNFO 540	Fundamentals of Molecular Genetics	3
BNFO 501	Introduction to Physical Implementation of Databases	1
BNFO 508	Introduction to Bioinformatics Research	2
BNFO 600	Basic Scripting Languages	2
BNFO/BIOL 601	Integrated Bioinformatics	3
BNFO 690	Seminars in Bioinformatics	1
BNFO 697	Directed Research in Bioinformatics (six credits minimum)	6
CMSC 508	Database Theory	3
OVPR 601	Scientific Integrity	1
Electives		
Select courses from recommended electives below		12
Total Hours		34

Recommended electives

Course	Title	Hours
BIOL/BNFO 541	Laboratory in Molecular Genetics	
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 620	Bioinformatics Practicum	
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	
BNFO 637	Networks Biology	
BNFO 691	Special Topics in Bioinformatics	
BNFO 691	Special Topics in Bioinformatics (genomics and phylogenetics)	
BNFO 692	Independent Study	
CLSE 562	Advanced Systems Biology Engineering	
CMSC 501	Advanced Algorithms	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
PHYS 591	Topics in Physics (modeling, computing and biocomplexity)	

Total graduate credit hours required (minimum) 34

Non-thesis option (professional science master's)

Course	Title	Hours
Core		
BIOL/BNFO 540	Fundamentals of Molecular Genetics	3
BNFO 501	Introduction to Physical Implementation of Databases	1
BNFO 600	Basic Scripting Languages	2
BNFO/BIOL 601	Integrated Bioinformatics	3
BNFO 620	Bioinformatics Practicum	3
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	3
BNFO 690	Seminars in Bioinformatics	1
BNFO 700	Externship in Bioinformatics	2
CMSC 508	Database Theory	3
OVPR 601	Scientific Integrity	1
Electives		
Select courses from recommended electives below		12
Total Hours		34

Recommended electives

Course	Title	Hours
BIOL/BNFO 541	Laboratory in Molecular Genetics	
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 637	Networks Biology	
BNFO/MICR 653	Advanced Molecular Genetics: Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	
BNFO 691	Special Topics in Bioinformatics (genomics and phylogenetics)	
BNFO 692	Independent Study	
CLSE 562	Advanced Systems Biology Engineering	
CMSC 501	Advanced Algorithms	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
PHYS 591	Topics in Physics (modeling, computing and biocomplexity)	

Total graduate credit hours required (minimum) 34

Graduate program director

Allison A. Johnson, Ph.D.
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Program website: csbc.vcu.edu/bioinformatics-programs (http://csbc.vcu.edu/bioinformatics-programs)

Bioinformatics, Master of Science (M.S.), accelerated Bachelor of Science in Bioinformatics (B.S.) to master's

Program goals

The VCU Center for the Study of Biological Complexity created and administers the Master of Science in Bioinformatics degree program to provide interested students with two options:

1. A traditional "thesis master's," including the development, implementation, writing and presentation of a coherent research project under the supervision of a graduate faculty member. This degree is most appropriate for students committed to initiating research careers in a variety of settings, including students considering pursuing later work toward a Ph.D.
2. A non-thesis option, including completion of a 10- to 12-week full-time externship in an industrial, government or academic site, usually during the summer between the first and second years of the bioinformatics program. This degree is most appropriate for students who wish to work in industrial/commercial settings.

Students enter the program from a variety of academic backgrounds (biology, chemistry, computer science, mathematics/statistics, etc.) assisted by flexible "bridge curricula" designed to help them meet program prerequisites. Students will have an effective exposure to the biotech industry and other career options and to real-life applications of their learning.

The Master of Science in Bioinformatics degree program will prepare students to:

1. **Synthesize and apply interdisciplinary subject matter:** The M.S. in Bioinformatics degree program seeks to provide students with the skills and knowledge required to advance into Ph.D. training programs and research positions in universities, government labs or industry. The program provides a framework for the progressive development of a mastery of the interdisciplinary subject matter pertinent to bioinformatics and an ability to synthesize this information and apply it to key areas of investigation and experimentation in bioinformatics.
2. **Design, implement and interpret experimental approaches:** The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches.
3. **Develop communication skills:** In addition, the program will develop skills in oral and written communication of interdisciplinary science concepts, experimental design, results and interpretation.

Student learning outcomes

1. **Oral communication skills:** The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. **Written communication skills:** The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information, including the use of figures, tables and citations, as measured by rubric.
3. **Experimental design competency:** The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify, and/or create and implement bioinformatics experimental protocols and to design and develop experiments, as measured by rubric.
4. **Problem-solving skills:** The candidate will demonstrate an appropriate level of ability to analyze scientific problems including pertinent datasets and design and develop appropriate methods to solve said problems, as measured by rubric.
5. **Integrated knowledge of bioinformatics:** The candidate will demonstrate an appropriate level of knowledge of fundamentals of molecular biology, computational science, statistics and a more detailed understanding of an individual area of internship research, including an appropriate familiarity with the research literature, as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	Jul 1	GRE
	Spring	Nov 15	
	Summer	May 1	

Special requirements

- Applicants must have junior or senior status in VCU's Bachelor of Science (B.S.) in Bioinformatics program and should discuss their interests with the bioinformatics coordinator during the junior year in order to plan the graduate courses to be taken during the senior year and shared between the two degrees.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants are encouraged to include in their personal statements, and to request that their referees also discuss, one or more examples of creative and analytical contributions they have made to a recent research project (preferred) or to a challenging course assignment.

The accelerated bachelor's to master's program in bioinformatics permits selected students majoring in bioinformatics to earn the bachelor's and master's degrees in a minimum of five years by taking certain graduate-level courses during the senior year of the undergraduate program. The program is restricted to students with strong credentials and a clear interest in a career in the field of bioinformatics.

In order to be admitted into the program, a student must be a VCU bioinformatics major, must have completed 90 undergraduate credit hours with an overall GPA of 3.0, including a substantial amount of collateral and core course work within the major and evidence of strong academic achievement. An application must be submitted to Graduate Admissions (http://www.graduate.admissions.vcu.edu). Students also are required to provide at least two letters of recommendation from their major professors attesting to their interest and competence in bioinformatics. Most students will be able to initiate the application process during the second semester of the junior year.

Following acceptance into the accelerated program, students must continue to meet the requirements stated above throughout the senior year, as well as the graduate student standards of performance specified in this bulletin, in order to be awarded formal acceptance into the graduate program, which typically takes place just prior to the fall semester of the fifth year.

Degree requirements

Accelerating students take as many as 12 graduate credits during the senior year. These credits may be applied to both the B.S. and M.S. degrees. These courses must be chosen in consultation with their undergraduate academic advisers. A sample set of shared credits is provided below.

Ordered list	Couses	Credits
1	BNFO 508 Introduction to Bioinformatics Research may replace BNFO 420 Applications in Bioinformatics.	2
2	Course work taken to meet master's requirements replaces undergraduate program electives or helps student meet general degree requirements for the B.S. degree (e.g. upper-level credits, total credits).	5
3	BIOL 540/BNFO 540 Fundamentals of Molecular Genetics and BIOL 541/BNFO 541 Laboratory in Molecular Genetics may be counted toward both degrees.	5
	Total shared graduate credit hours	**12**

Prerequisites and bridge curricula for master's programs

Program prerequisites are listed below. In general, bioinformatics undergraduate students will meet most prerequisite requirements while completing the undergraduate major. It is expected that any remaining bridge course work will be completed during the first year of the graduate program.

1. **Biology/genomic prerequisites:** an introductory knowledge of biochemistry and molecular biology, one semester of organic chemistry (e.g. CHEM 301), cell biology (e.g. BIOL 300) and Essentials of Molecular Biology in Bioinformatics (two-credit module: BNFO 507)
2. **Computational science prerequisites:** an introductory knowledge of discrete mathematics (e.g. MATH 211) and an introductory knowledge of computer science, including at least one general computer programming language, met by taking structured programming (e.g. CMSC 255) and data structures and advanced programming (e.g. CMSC 256)
3. **Quantitative/statistical prerequisites:** an introductory knowledge of mathematics/statistics, met by taking calculus with analytic geometry I (e.g. MATH 201) and Introduction to Statistical Computing (STAT 321) or Applied Statistics for Engineers and Scientists (STAT 441)

Thesis research

In addition to general VCU Graduate School graduation requirements (p. 31), students in the M.S. program must perform a credible original investigation under the supervision of their major advisers and the Graduate Advisory Committee. Students must develop and write short proposals in consultation with their major advisers and GAC. The project must be approved by the student's GAC, based on a short (10-page) paper submitted by the student. This paper will include background on the

project, including a review of the literature, the purpose, specific aims and rationale of the project, a statement about the specific hypothesis to be investigated, and proposed methods and statistical analyses.

Research projects will be based on ongoing research in the laboratories of faculty in the CSBC and across both campuses of VCU and the Virginia BioTechnology Research Park. Students in the program may perform research on the broad range of subjects, from molecules to ecosystems, studied by CSBC faculty.

Students shall prepare a written thesis describing the completed research performed during their tenure in the M.S. in Bioinformatics program following the format of the Graduate School Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf). An oral defense, consisting of a public presentation of the thesis and a committee meeting to discuss the thesis, under the direction of the GAC but open to all faculty members, shall be scheduled to examine the student's research, thesis and underlying fundamental knowledge of the discipline encompassed by the student's research. Announcement of the oral defense, including the candidate's name, thesis title and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Non-thesis externship

In addition to general VCU Graduate School graduation requirements (p. 31), students enrolled in the non-thesis option complete a 10- to 12-week full-time externship at an industrial, government or academic site, usually during the summer between the first and second years of the bioinformatics program. In preparation for this externship, students will enroll in BNFO 620 in the semester preceding their externships. Under the supervision of their major advisers and graduate advisory committee, the external supervisor, and the coordinator of the bioinformatics practicum course, each student must develop and write a short proposal outlining the plans for the externship. The project must be approved by the student's GAC, based on a short (10-page) paper submitted by the student. This paper will include background on the project, including a review of the literature, the purpose, specific aims and rationale of the project, a statement about the specific hypothesis to be investigated, and proposed methods and statistical analyses. Research projects will be based on ongoing research in the laboratories of the participating external advisers. Students in the program may perform research on a broad range of subjects, from molecules to ecosystems, encompassing the field of bioinformatics.

In the semester following the externship experience, non-thesis students shall prepare written papers describing the completed research performed during their externships following the format of the Graduate School's Thesis and Dissertation Manual (http://graduate.vcu.edu/media/graduate-school/docs/pdf/ThesisandDissertationManualUPDATED5-18-16.pdf). An oral defense, consisting of a public presentation of the paper and a committee meeting to discuss the results, under the direction of the GAC but open to all faculty members and the adviser of the externship, shall be scheduled to examine the student's underlying fundamental knowledge of the disciplines encompassed by the student's research. Announcement of the oral defense, including the candidate's name, project title, and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Curriculum requirements

Thesis option

Course	Title	Hours
Core		
BNFO 501	Introduction to Physical Implementation of Databases	1
BNFO 508	Introduction to Bioinformatics Research	2
BNFO/BIOL 540	Fundamentals of Molecular Genetics	3
BNFO 600	Basic Scripting Languages	2
BNFO/BIOL 601	Integrated Bioinformatics	3
BNFO 690	Seminars in Bioinformatics	1
BNFO 697	Directed Research in Bioinformatics (six credits minimum)	6
CMSC 508	Database Theory	3
OVPR 601	Scientific Integrity	1
Electives		
Select courses from recommended electives below		12
Total Hours		34

Recommended electives

Course	Title	Hours
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BNFO/BIOL 541	Laboratory in Molecular Genetics	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 620	Bioinformatics Practicum	
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	
BNFO 637	Networks Biology	
BNFO/MICR 653	Advanced Molecular Genetics: Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	
BNFO 691	Special Topics in Bioinformatics (genomics and phylogenetics)	
BNFO 692	Independent Study	
CLSE 562	Advanced Systems Biology Engineering	
CMSC 501	Advanced Algorithms	
PHYS 591	Topics in Physics (modeling, computing and biocomplexity)	

Total graduate credit hours required (minimum) 34

Non-thesis option

Course	Title	Hours
Core		
BNFO 501	Introduction to Physical Implementation of Databases	1
BNFO/BIOL 540	Fundamentals of Molecular Genetics	3
BNFO 600	Basic Scripting Languages	2
BNFO/BIOL 601	Integrated Bioinformatics	3
BNFO 620	Bioinformatics Practicum	3
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	3

BNFO 690	Seminars in Bioinformatics	1
BNFO 700	Externship in Bioinformatics	2
CMSC 508	Database Theory	3
OVPR 601	Scientific Integrity	1
Electives		
Select courses from recommended electives below		12
Total Hours		34

Recommended electives

Course	Title	Hours
BIOS 567	Statistical Methods for High-throughput Genomics Data I	
BNFO/BIOL 541	Laboratory in Molecular Genetics	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 637	Networks Biology	
BNFO/MICR 653	Advanced Molecular Genetics: Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	
BNFO 691	Special Topics in Bioinformatics (genomics and phylogenetics)	
BNFO 692	Independent Study	
CLSE 562	Advanced Systems Biology Engineering	
CMSC 501	Advanced Algorithms	
PHYS 591	Topics in Physics (modeling, computing and biocomplexity)	

Total graduate credit hours required (minimum) 34

Graduate program director
Allison A. Johnson, Ph.D.
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(804) 828-6782

Program website: csbc.vcu.edu/bioinformatics-programs (http://csbc.vcu.edu/bioinformatics-programs)

Integrative Life Sciences, Doctor of Philosophy (Ph.D.)

Program mission

The Ph.D. in Integrative Life Sciences is designed for students who want to conduct research that is integrative across multiple disciplines and that takes a systems approach to emerging research questions across the many fields that comprise the life sciences. Students may opt to work with faculty members from any department, center or institute across VCU campuses. The program provides the opportunity to conduct interdisciplinary research at multiple scales of study from the molecular to ecosystem levels with an emphasis on the concepts of systems biology and biological complexity.

Program goals

1. **Interdisciplinary knowledge and skills:** The core curriculum of the ILS program will effectively assist students in gaining understanding of modern systems biology along with training in the interdisciplinary skills and knowledge increasingly required for doing effective research in the life sciences. It will also foster progressive development of a mastery of the current state of the research in students' areas of interest as they seek to identify key focus areas for their integrative research.
2. **Research skills:** The mentored research component of the program, building on the core curriculum and interdisciplinary elective course work, will foster development of an ability to synthesize this learning and identify key focus areas for integrative research. It will support students as they learn how to design, implement and interpret interdisciplinary experimental approaches that will best address their research questions.
3. **Communication skills:** Students in the program will develop skills in both written and oral communication of life science knowledge, experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. **Oral communication skills:** The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. **Written communication skills:** The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations, as measured by rubric.
3. **Experimental design:** The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify, and/or create and implement experimental protocols and to design and develop experiments, as measured by rubric.
4. **Problem-solving skills:** The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems, as measured by rubric.
5. **Integrated knowledge:** The candidate will demonstrate an appropriate level of knowledge of the life sciences and a more detailed understanding of the disciplines most pertinent to their own interdisciplinary research areas, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as

published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred)	Jan. 10	GRE
			TOEFL, IELTS or equivalent for international students

Note: All application components must be received by Jan. 10 to be competitive.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the Ph.D. in Integrative Life Sciences program requires graduation from an accredited college or university or its equivalent with a degree that is preparative for graduate-level study in the life sciences. Applicants should have a minimum GPA of 3.0 on a 4.0 scale, and scores on the Graduate Record Examination should exceed the 50th percentile in each category. For international applicants, satisfactory scores from a standardized test, such as the TOEFL (a minimum score of 100) or IELTS (minimum band scores of 7.0), must be submitted along with external evaluation of undergraduate transcripts from nondomestic educational institutions (see Graduate Admissions website (http://graduate.admissions.vcu.edu/apply) for further details).

Letters of recommendation from three present or former professors, advisers or mentors qualified to evaluate the applicant's ability to engage in graduate research in the life sciences are required, as is a written statement from the applicant describing the applicant's research interests, motivation, research experience, education and goals for pursuing graduate study in this particular program, preferred research adviser(s), official transcripts from all past postsecondary educational institutions, official GRE scores, and current curriculum vita or resume. Applicants are **strongly** encouraged to contact potential research advisers prior to submitting application materials and to identify potential research advisers in their personal statements. Individuals who have identified a research adviser will be given preference for admittance and funding.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the degree must be completed within eight years of the first enrollment.

1. **Credit-hour requirements:** Students in the program are required to earn a minimum of 64 graduate-level credit hours. At least one-half of the graduate credit hours presented for graduation must be at the 600 level or higher.
2. **Grade requirement:** Degree applicants must achieve an overall GPA of 3.0 (B) with a grade of C in no more than one course. The GPA for graduation is based on all graduate courses attempted after acceptance into the program.
3. **Transfer/waiver credit:** Graduate-level VCU course work taken as a nondegree-seeking student or in a previous graduate matriculation for which a degree was never awarded may be evaluated to determine whether it can be used to fulfill degree requirements of this program in accordance with the VCU Graduate School transfer policy (p. 27). Course work completed toward a previous degree can also be considered as a waiver of program core or elective course work requirements. In these cases, the requirement(s) are waived, and other course work or research credits can be used to make up credits needed toward the degree. A minimum grade of B is required for credit hours transferred or waived.
4. **Research adviser and committee:** Students should select a research adviser prior to matriculation, but no later than the end of the first semester. The research adviser may be chosen from among the many graduate faculty members from any VCU research unit. This research adviser is approved by the program director in accordance with the Graduate School bylaws.

   Students are required to form a research advisory committee that is headed by the research adviser (as chair) and that consists of a minimum of four other members of the VCU graduate faculty. Individuals who are not graduate faculty members (i.e., individuals from another institution or industry) must apply to the dean of the Graduate School for temporary affiliate graduate faculty appointment. The significant areas of the student's research focus should be represented by the members of the research advisory committee. At least two members of the committee should have primary appointments in departments other than that of the research adviser, with one of those members being integrally associated with the student's research to foster the interdisciplinary intent of this degree program. Students should form their committees no later than

the end of the second semester of study. This committee must be approved by the program director.

5. **Written and oral examinations:** Before admission to degree candidacy for the Ph.D. degree, students must successfully complete a comprehensive examination and a research proposal examination. The student's research advisory committee will administer both exams. Students should take the comprehensive exam upon completion of all required didactic course work, usually no later than the end of the fourth semester of study. It may be written or oral (or both) and will focus on material covered in core and selected elective courses as well as fundamental knowledge relevant to the student's research field. Upon successful completion of the comprehensive examination, and submission and acceptance of a written research proposal, students will take an oral examination that includes a defense of the proposed research project and other subject areas deemed appropriate by the committee. Students may retake the comprehensive and research proposal examinations only once each. Written evaluations of the examinations will be completed by research advisory committee members. These valuations are provided to the chair of the research advisory committee and to the program director for discussion with the student and for program assessment.
6. **Dissertation research:** The dissertation research project should represent a significant contribution to the body of knowledge in its field and should be deemed suitable for publication in refereed journals. The emphasis of the research conducted by students in this program should be on interdisciplinary research, incorporating two or more disciplines. Research projects may take advantage of the many research opportunities across the life sciences on both campuses. Students shall prepare a written dissertation describing the completed research using the format approved by the Graduate School. An oral defense of the dissertation, under the direction of the research advisory committee and open to the public, also is required. Written evaluations of the dissertation and the oral defense of the dissertation will be completed by research advisory committee members. These evaluations are provided to the chair of the research advisory committee and to the program director for discussion with the student and for program assessment. Upon successful completion of all degree requirements, students will graduate with the Ph.D. in Integrative Life Sciences.

Curriculum requirements

A minimum total of 64 graduate credit hours is required and is distributed as follows:

Course	Title	Hours
Core courses		
LFSC 630	Integrative Life Sciences Research	2
LFSC 631	Student Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
LFSC 690	Research Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
Scientific integrity course		
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Technologies course (these are options; students may suggest any course for approval)		
Select one of the following:		2
ANAT 615	Techniques in Neuroscience and Cell Biology	
BNFO/BIOL 541	Laboratory in Molecular Genetics	
BNFO 650	Sequence Analysis in Biological Systems	
ENVS 602	Environmental Technology	
MICR 607	Techniques in Molecular Biology and Genetics	
MICR/BNFO 653	Advanced Molecular Genetics: Bioinformatics	
Advanced statistics, advanced mathematics or experimental design course		
Select one of the following: [2,3]		3
BIOL 606	Quantitative Ecology	
BIOS 524	Biostatistical Computing	
BIOS 572	Analysis of Biomedical Data I	
BNFO/BIOL 601	Integrated Bioinformatics	
ENVS 603	Environmental Research Methods	
LFSC 610	Analytical Methods in Biocomplexity Analysis	
MATH 591	Topics in Mathematics (mathematical biology)	
STAT 544	Statistical Methods II	
or BIOS 544	Graduate Research Methods II	
STAT 623	Discrete Multivariate Analysis	
STAT 643	Applied Linear Regression	
Other courses based on approval of research advisory committee		
Elective courses		
Select nine credit hours of the following: [4,5]		9
500-level or higher courses in ANAT, ANTH, BIOC, BIOL, BIOS, BNFO, CHEM, CLSE, CMSC, EDUS, EGRB, ENVS, EPID, FRSC, HGEN, MATH, MEDC, MEDP, MICR, NANO, NEUS, OPER, PATH, PCEU, PHAR, PHIS, PHTX, PSCI, PSYC or STAT		
Directed research		43
LFSC 697	Directed Research in Integrative Life Sciences	
Total Hours		64

[1] Does not count toward three credit-hour restriction for Preparing Future Faculty courses

[2] Depending on the student's area of research

[3] Students are expected to enter the program proficient in statistics at the introductory level, as exemplified by STAT 543 or BIOS 543. Students not

at this level, as evidenced by prior course work, will be required to take STAT 543 or BIOS 543 or an equivalent course.

4

Based on research interest and approved by research advisory committee

5

Only three credits of Preparing Future Faculty (GRAD) courses will be accepted toward the nine credit hours of electives (exclusive of OVPR responsible conduct of research).

Total graduate credit hours required (minimum) 64

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Program website: lifesciences.vcu.edu/academic-programs/phd-in-integrative-life-sciences (http://lifesciences.vcu.edu/academic-programs/phd-in-integrative-life-sciences)

Integrative Life Sciences, Doctor of Philosophy (Ph.D.) with a concentration in bioinformatics and genome sciences

Program mission

The Ph.D. in Integrative Life Sciences is designed for students who want to conduct research that is integrative across multiple disciplines and that takes a systems approach to emerging research questions across the many fields that comprise the life sciences. Students may opt to work with faculty members from any department, center or institute across VCU campuses. The program provides the opportunity to conduct interdisciplinary research at multiple scales of study from the molecular to ecosystem levels with an emphasis on the concepts of systems biology and biological complexity.

Program goals

1. **Interdisciplinary knowledge and skills:** The core curriculum of the ILS program will effectively assist students in gaining understanding of modern systems biology along with training in the interdisciplinary skills and knowledge increasingly required for doing effective research in the life sciences. It will also foster progressive development of a mastery of the current state of the research in students' areas of interest as they seek to identify key focus areas for their integrative research.
2. **Research skills:** The mentored research component of the program, building on the core curriculum and interdisciplinary elective course work, will foster development of an ability to synthesize this learning and identify key focus areas for integrative research. It will support students as they learn how to design, implement and interpret interdisciplinary experimental approaches that will best address their research questions.
3. **Communication skills:** Students in the program will develop skills in both written and oral communication of life science knowledge, experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. **Oral communication skills:** The candidate will demonstrate the achievement of an appropriate level of oral communication skills with respect to the content, organization, logical flow, presentation and appropriate use of language incorporating the use of visual aids, as measured by rubric.
2. **Written communication skills:** The candidate will demonstrate the achievement of an appropriate level of written communication skill with respect to grammar, syntax, spelling and use of vocabulary to effectively present information including the use of figures, tables and citations, as measured by rubric.
3. **Experimental design:** The candidate will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify, and/or create and implement experimental protocols and to design and develop experiments, as measured by rubric.
4. **Problem-solving skills:** The candidate will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems, as measured by rubric.
5. **Integrated knowledge:** The candidate will demonstrate an appropriate level of knowledge of the life sciences and a more detailed understanding of the disciplines most pertinent to their own interdisciplinary research areas, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications, as measured by rubric.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary

depending upon the program, nature of research being conducted by a study or in the enrollment or funding status of the student. Students should refer to their program websites and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred)	Jan. 10	GRE
			International students require TOEFL, IELTS or equivalent

Note: All application components must be received by Jan. 10 to be competitive.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the Ph.D. in Integrative Life Sciences program requires graduation from an accredited college or university or its equivalent with a degree that is preparative for graduate-level study in the life sciences. Applicants should have a minimum GPA of 3.0 on a 4.0 scale, and scores on the Graduate Record Examination should exceed the 50th percentile in each category. For international applicants, satisfactory scores from a standardized test, such as the TOEFL (a minimum score of 100) or IELTS (minimum band scores of 7.0), must be submitted along with external evaluation of undergraduate transcripts from nondomestic educational institutions (see Graduate Admissions website (http://graduate.admissions.vcu.edu/apply) for further details).

The ideal applicant with a Bachelor of Science degree will have performed well in biology courses through cell and molecular biology and genetics; mathematics, including linear algebra and statistics; chemistry, including analytical and organic; physics; and computer science with significant programming skills, basic scripting languages (e.g., PYTHON and R) and an understanding of databases and database structures. A successful applicant with all of the above skills will be required to complete a core curriculum of 23 credits of didactic courses, 12 credits of appropriate electives and 30 credits of directed research (see B.S. to Ph.D. curriculum below).

Students with a previous master's degree in bioinformatics, an appropriate science or computational subject will be expected to have all of the prerequisite skills described above for the B.S. to Ph.D. option, plus a graduate-level understanding of basic molecular biology and metabolism, the major concepts in bioinformatics and a comprehensive understanding of the algorithms underlying major bioinformatics tools.

Letters of recommendation from three present or former professors, advisers or mentors qualified to evaluate the applicant's ability to engage in graduate research in the life sciences are required, as is a written statement from the applicant describing the applicant's research interests, motivation, research experience, education and goals for pursuing graduate study in this particular program, preferred research adviser(s), official transcripts from all past postsecondary educational institutions, official GRE scores, and current curriculum vita or resume. Applicants are **strongly** encouraged to contact potential research advisers prior to submitting application materials and to identify potential research advisers in their personal statements. Individuals who have identified a research adviser will be given preference for admittance and funding.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to complete course work in core and elective courses and to conduct significant research. All work toward the degree must be completed within eight years of the first enrollment.

1. **Credit-hour requirements:** Students pursuing the concentration in bioinformatics and genome sciences are required to earn a minimum of 50 (for M.S. to Ph.D.) or 64 (for B.S. to Ph.D.) graduate-level credit hours. At least one-half of the graduate credit hours presented for graduation must be at the 600 level or higher. No elective courses may be used for both M.S. and Ph.D. degrees.
2. **Grade requirement:** Degree applicants must achieve an overall GPA of 3.0 (B) with a grade of C in no more than one course. The GPA for graduation is based on all graduate courses attempted after acceptance into the program.
3. **Transfer/waiver credit:** Graduate-level VCU course work taken as a nondegree-seeking student or in a previous graduate matriculation for which a degree was never awarded may be evaluated to determine whether it can be used to fulfill degree requirements of this program in accordance with the VCU Graduate School transfer policy (p. 27). Course work completed toward a previous degree can also be considered as a waiver of program core or elective course work requirements. In these cases, the requirement(s) are waived, and other course work or research credits can be used to make up credits needed toward the degree. A minimum grade of B is required for credit hours transferred or waived.
4. **Research adviser and committee:** Students should select a research adviser prior to matriculation, but no later than the end of the first semester. The research adviser may be chosen from among the many graduate faculty members from any VCU research unit. This research adviser is approved by the program director in accordance

with the Graduate School bylaws. Students are required to form a research advisory committee that is headed by the research adviser and that consists of a minimum of four other members of the VCU graduate faculty. Individuals who are not graduate faculty members (i.e., individuals from another institution or industry) must apply to the dean of the Graduate School for temporary affiliate graduate faculty appointment. The significant areas of the student's research focus should be represented by the members of the research advisory committee. At least two members of the committee should have primary appointments in departments other than that of the research adviser, with one of those members being integrally associated with the student's research to foster the interdisciplinary intent of this degree program. Students should form their committees no later than the end of the second semester of study. This committee must be approved by the program director.

5. **Written and oral examinations:** Before admission to degree candidacy for the Ph.D. degree, students must successfully complete a comprehensive examination and a research proposal examination. The student's research advisory committee will administer both exams. Students should take the comprehensive exam upon completion of all required didactic course work, usually no later than the end of the fourth semester of study. It may be written or oral (or both) and will focus on material covered in core and selected elective courses as well as fundamental knowledge relevant to the student's research field. Upon successful completion of the comprehensive examination and submission and acceptance of a written research proposal, students will take an oral examination that includes a defense of the proposed research project and other subject areas deemed appropriate by the committee. Students may retake the comprehensive and research proposal examinations only once each. Written evaluations of the examinations will be completed by research advisory committee members. These valuations are provided to the chair of the research advisory committee and to the program director for discussion with the student and for program assessment.
6. **Dissertation research:** The dissertation research project should represent a significant contribution to the body of knowledge in its field and should be deemed suitable for publication in refereed journals. The emphasis of the research conducted by students in this program should be on interdisciplinary research and incorporate two or more disciplines. Research projects may take advantage of the many research opportunities across the life sciences on both campuses. Students shall prepare a written dissertation describing the completed research using the format approved by the Graduate School. An oral defense of the dissertation, under the direction of the research advisory committee and open to the public, also is required. Written evaluations of the dissertation and the oral defense of the dissertation will be completed by research advisory committee members. These evaluations are provided to the chair of the research advisory committee and to the program director for discussion with the student and for program assessment. Upon successful completion of all degree requirements, students will graduate with the Ph.D. in Integrative Life Sciences.

Curriculum requirements

B.S. to Ph.D. curriculum

Course	Title	Hours
Core courses		
LFSC 630	Integrative Life Sciences Research	2
LFSC 631	Student Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
LFSC 690	Research Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
Scientific integrity		
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Advanced statistics, advanced mathematics or experimental design course		
BIOS/STAT 513	Mathematical Statistics I	3
or STAT 641	Applied Data Analysis	
Technologies course (recommended options; choice depends on student's specialty)		
BNFO 691	Special Topics in Bioinformatics (biological sequence analysis: methods and applications)	3
Additional required concentration courses		
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	2
BIOC 531	Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism	1
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	1
BNFO 601	Integrated Bioinformatics	3
Recommended elective courses (based on research interest and approved by research advisory committee)		
Select a minimum of 12 hours from the following:		12
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	
BIOL 516	Population Genetics	
BIOL 550	Ecological Genetics	
BIOL 591	Special Topics in Biology	
BIOL 606	Quantitative Ecology	
BIOL 650	Conservation Genetics	
BIOL 691	Special Topics in Biology	
BIOS/STAT 514	Mathematical Statistics II	
BIOS 524	Biostatistical Computing	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 601	Integrated Bioinformatics	
BNFO 620	Bioinformatics Practicum	
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	
BNFO 637	Networks Biology	
BNFO/MICR 653	Advanced Molecular Genetics: Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	

BNFO 692	Independent Study	
CMSC 501	Advanced Algorithms	
CMSC 502	Parallel Algorithms	
CLSE 562	Advanced Systems Biology Engineering	
HGEN 501/ BIOL 530	Introduction to Human Genetics	
HGEN 614	Pathogenesis of Human Genetic Disease	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
MICR 505	Immunobiology	
MICR 605	Prokaryotic Molecular Genetics	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis	
STAT 643	Applied Linear Regression	
Directed research (minimum 32 credit hours)		32
LFSC 697	Directed Research in Integrative Life Sciences	
Total Hours		64

Total number of graduate credit hours required (minimum) 64

M.S. to Ph.D. curriculum

Course	Title	Hours
Core courses		
LFSC 630	Integrative Life Sciences Research	2
LFSC 631	Student Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
LFSC 690	Research Seminar in Integrative Life Sciences (one credit hour taken two semesters)	2
Scientific integrity		
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Advanced statistics, advanced mathematics or experimental design course		
BIOS/STAT 513	Mathematical Statistics I	3
or STAT 641	Applied Data Analysis	
Technologies course (recommended options; choice depends on student's specialty)		
BNFO 691	Special Topics in Bioinformatics (biological sequence analysis: methods and applications)	3
Recommended elective courses (based on research interest and approved by research advisory committee)		
Select a minimum of six hours from the following:		6
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOC 533	Biochemistry, Cell and Molecular Biology Module 4: Lipids/Membranes and Bioenergetics	
BIOL 516	Population Genetics	
BIOL 550	Ecological Genetics	
BIOL 591	Special Topics in Biology	
BIOL 606	Quantitative Ecology	
BIOL 650	Conservation Genetics	
BIOL 691	Special Topics in Biology	
BIOS/STAT 514	Mathematical Statistics II	
BIOS 524	Biostatistical Computing	
BNFO 591	Special Topics in Bioinformatics	
BNFO 592	Independent Study	
BNFO 601	Integrated Bioinformatics	
BNFO 620	Bioinformatics Practicum	
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	
BNFO 637	Networks Biology	
BNFO/MICR 653	Advanced Molecular Genetics: Bioinformatics	
BNFO 691	Special Topics in Bioinformatics	
BNFO 692	Independent Study	
CMSC 501	Advanced Algorithms	
CMSC 502	Parallel Algorithms	
CLSE 562	Advanced Systems Biology Engineering	
HGEN 501/ BIOL 530	Introduction to Human Genetics	
HGEN 614	Pathogenesis of Human Genetic Disease	
MEDC 541	Survey of Molecular Modeling Methods	
MEDC 670	Advanced Molecular Modeling Theory and Practice	
MICR 505	Immunobiology	
MICR 605	Prokaryotic Molecular Genetics	
MICR 616	Mechanisms of Viral and Parasite Pathogenesis	
MICR 618	Molecular Mechanisms of Bacterial Pathogenesis	
STAT 643	Applied Linear Regression	
Directed research (minimum 31 credit hours)		31
LFSC 697	Directed Research in Integrative Life Sciences	
Total Hours		50

Total number of graduate credit hours required (minimum) 50

Graduate program director

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(804) 828-6920

Additional contact

Regina Jefferson
Executive administrative assistant
lrjeffer@vcu.edu

(804) 827-1865

Program website: lifesciences.vcu.edu/academic-programs/phd-in-integrative-life-sciences (http://lifesciences.vcu.edu/academic-programs/phd-in-integrative-life-sciences)

DA VINCI CENTER FOR INNOVATION

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Richmond, Virginia 23284
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Garret Westlake
Executive director

A collaboration of VCU's schools of the Arts, Business, Engineering and College of Humanities and Sciences, the VCU da Vinci Center is a unique collegiate model that advances innovation and entrepreneurship through cross-disciplinary collaboration.

The academic and other program offerings of the da Vinci Center aim to create T-shaped individuals: individuals who are anchored in a discipline and have the capacity and openness to span across disciplines.

Students participating in the da Vinci Center view innovation and entrepreneurship from multiple disciplinary perspectives and, thus, are prepared for the 21st-century workforce by more robustly approaching the innovation/entrepreneurship endeavor.

- Product Innovation, Master of (M.P.I.) (p. 863)

Product Innovation, Master of (M.P.I.)

Program mission and objectives

Integrating arts, business and engineering principles, students in the Master of Product Innovation learn advanced product innovation topics pertaining to conceptualization, development and commercialization of new products/services. Through unique instruction and experiential learning that culminates with a yearlong master's project, students have a real product innovation experience. The program emphasizes product innovation and teamwork skills so that graduates can take on key leadership roles that stimulate the creation, development and management of new products and services.

Student learning outcomes

The M.P.I. program hones competency in the area of product innovation. Students will:

1. Demonstrate successful collaboration skills
2. Demonstrate the ability to conceive and develop product concepts and related business plans
3. Demonstrate the ability to think across multiple disciplines
4. Demonstrate the ability to create and deliver effective presentations and other communication media such as reports and portfolios

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.P.I.	Summer	Apr 15	See special requirements below

Special requirements

- At the time of application, an applicant declares an area of specialization: arts, business or engineering. The arts specialization requires the submission of a portfolio comprising 20 to 30 examples of representative work; the business specialization requires either the GMAT or GRE; and the engineering specialization requires the GRE. A personal interview may be requested.

In addition to the general admission requirements of the VCU Graduate School (p. 34), the following requirements represent the minimum acceptable standards for admission:

1. A bachelor's degree or equivalent from an accredited college or university
2. Except in very unusual cases approved by the graduate dean, a minimum undergraduate GPA of 3.0 on a 4.0 scale for at least the last two years of undergraduate work
3. For applicants whose native language is not English, satisfactory scores from a standardized test commonly used and deemed appropriate for evaluation of English language proficiency, such as the TOEFL
4. Three letters of recommendation
5. Applicant's written statement of intent for pursuing graduate study in the product innovation discipline

Degree requirements

The Master of Product Innovation requires a minimum of 30 graduate credit hours for completion. In addition to general VCU Graduate School graduation requirements (p. 31), students must:

1. Complete the boot camp experience prior to the first semester of study in the program
2. Complete the required core curriculum courses (12 or 15 credit hours of specified course work depending on undergraduate degree)
3. Complete two elective courses (six credit hours) with one of these courses at the 600 level
4. Complete the master's project courses (12 credit hours) (The master's project is mandatory for all students.)

The program can be taken either on a full-time or part-time basis.

Curriculum requirements

Course	Title	Hours
Core requirements		
Select two or three of the following: [1]		6-9
INNO 501	Arts Principles for Product Innovation	
INNO 502	Business Principles for Product Innovation	
INNO 503	Technology Principles for Product Innovation	
INNO 590	da Vinci Project	3
INNO 600	Integrative Design Studio	3
Technical electives		
Select two of the following: [2]		6
INNO 691	Topics in Product Innovation	
INNO 697	Guided Study in Product Innovation	
Other approved graduate-level course [3]		
Master's project		
INNO 651	Master's Project in Product Innovation I	6
INNO 652	Master's Project in Product Innovation II	6
Total Hours		30-33

1

Select depending on which courses do not correspond to the undergraduate degree. If the student does not have an undergraduate degree in an arts, business or engineering discipline, all three courses must be taken. **Note:** Students are strongly encouraged to take all three courses regardless of undergraduate degree.

2

All technical electives must be at the graduate level, with at least three credit hours at the 600 level.

3

Specific courses will be determined by the student with approval by the M.P.I. faculty committee.

Total number of graduate credit hours required (minimum) 30

Sample full-time enrollment plan of study

Year one		
Summer semester		**Hours**
INNO 600	Integrative Design Studio	3
INNO 691	Topics in Product Innovation	3
	Term Hours:	6
Fall		
INNO 501	Arts Principles for Product Innovation [1]	3
INNO 502	Business Principles for Product Innovation [1]	3
INNO 503	Technology Principles for Product Innovation [1]	3
INNO 590	da Vinci Project	3
	Term Hours:	9-12
Spring		
INNO 651	Master's Project in Product Innovation I	6
INNO 691	Topics in Product Innovation (or other 500-600 level technical elective approved by MPI faculty committee)	3
	Term Hours:	9
Year two		
Summer semester		
INNO 652	Master's Project in Product Innovation II	6
	Term Hours:	6
	Total Hours:	30-33

1

Select depending on which courses do not correspond to the undergraduate degree. If the student does not have an undergraduate degree in an arts, business or engineering discipline, all three courses must be taken. Note: Students are strongly encouraged to take all three courses regardless of undergraduate degree.

Graduate program director
Garret Westlake
Executive director, da Vinci Center for Innovation
Email: gmwestlake@vcu.edu
Phone: (804) 828-3477

Program website: davincicenter.vcu.edu/programs/master-product-innovation (http://www.davincicenter.vcu.edu/programs/master-product-innovation)

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Francis L. Macrina, Ph.D.
Vice president for research and innovation

The mission of the Virginia Commonwealth University Office of Research and Innovation is to create an environment that enables university investigators to: 1) effectively compete for research funding, 2) responsibly conduct research in compliance with mandated policies and 3) broadly disseminate knowledge gained and discoveries made.

Research universities provide the nexus of discovery, education and service. The research process evolves into scholarly publication, enlightening histories, interpretative arts, lifesaving drugs and remarkable innovations ranging from nanotechnology to macroeconomics. Each day VCU researchers make progress toward improving quality of life and understanding of the world around us.

Research at VCU provides an incubator for training new scholars and a new generation of students who understand where and how knowledge is formed. No matter their chosen career, all researchers benefit from the curiosity instilled and the recognition that learning is a lifelong process.

The research enterprise at VCU has made substantial forward steps in recent years, doubling the sponsored award base, renovating laboratories, rebuilding the research subjects' protection program and investing in state-of-the-art animal care equipment and facilities.

The VCU Office of Research ad Innovation seeks to partner with faculty in all schools and departments as they seek funding, plan studies, establish collaborations, calculate budgets, submit grant applications, negotiate industry contracts and secure patents and licensing agreements. Skilled staff within each of the major divisions — sponsored programs administration, research subjects protection, animal research, technology transfer, industry partnerships, and education and oversight — look forward to helping VCU faculty in all realms of the research process.

Affiliated research institutes include the Center for Clinical and Translational Research (and its Research Incubator), the Institute for Drug and Alcohol Studies, the Philips Institute for Oral Health Research, the Virginia Institute for Psychiatric and Behavioral Genetics, the Institute for Structural Biology and Drug Discovery and the Institute for Women's Health.

Center for Clinical and Translational Research

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Phone: (804) 827-1531
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cctr.vcu.edu (http://www.cctr.vcu.edu)

F. Gerard Moeller, M.D.
Director

The Center for Clinical and Translational Research at Virginia Commonwealth University provides the necessary longitudinal and cross-disciplinary network, culture and infrastructure for identifying promising discoveries made in the laboratory, testing them in animals and developing trials and studies for humans.

Joint participation of researchers from across the university is critical to this mission. Partnerships with foundations and industry — particularly the support of the Virginia BioTechnology Research Park — is also crucial for moving these discoveries to the clinic. At the same time, mutually beneficial partnerships with community practitioners, community organizations and patients enhance the adoption of evidence-based best practices in general clinical practice and thus deliver improved medical care to the region.

The center offers a corridor in which participants in the translational research continuum can meet, interact and advance each others' missions. Bench and computer scientists will learn from animal models and clinician observations. Clinical researchers will recognize the need for communication with basic scientists to direct experimental design. Community practitioners will better understand their role in informing the clinical research process and participating in pragmatic clinical trials. Patients will develop a higher comfort level with "medical research."

The center also serves as the administrative unit for the interdisciplinary graduate degrees in clinical and translational sciences.

Research Incubator

The Clinical and Translational Research Incubator is designed to serve as a hub for resources and networking opportunities for established researchers and junior clinical investigators who are working on novel, interdisciplinary and collaborative clinical research at VCU. The RI will support its investigators by coordinating and optimizing current resources and by developing innovative new resources to facilitate the research process. It is anticipated that faculty researchers from the schools of Allied Health Professions, Dentistry, Education, Engineering, Medicine, Nursing, Pharmacy and Social Work, as well as the College of Humanities and Sciences, will access services at the RI.

- Clinical and Translational Sciences, Doctor of Philosophy (Ph.D.) with a concentration in cancer and molecular medicine (p. 866)
- Clinical and Translational Sciences, Doctor of Philosophy (Ph.D.) with a concentration in psychiatric, behavioral and statistical genetics (p. 870)
- Clinical and Translational Sciences, Master of Science (M.S.) (p. 875)

Clinical and Translational Sciences, Doctor of Philosophy (Ph.D.) with a concentration in cancer and molecular medicine

Program goal

The doctoral program in clinical and translational sciences offers a general curriculum, an interdisciplinary concentration in psychiatric,

behavioral and statistical genetics and a concentration in cancer and molecular medicine.

Students who pursue the doctoral program in clinical and translational sciences will be grounded in a relative substantive area and be prepared to integrate data from multiple disciplines, have strong communication and computational skills and be sufficiently flexible to easily move among different projects and research venues.

Student learning outcomes

Students who complete the program should achieve the following core competencies:

1. Understand, integrate and apply relevant biomedical biobehavioral concepts and theoretical frameworks to research
2. Comprehend, select and apply the appropriate study design to address specific health issues
3. Critically review the scientific literature by applying sound research knowledge and principles to the review
4. Apply data collection processes and information technology to create, maintain and secure databases and other information
5. Apply ethical principles to study design, data collection and dissemination
6. Devise an analysis plan (statistical methodology) and analyze data using methods appropriate for the study design and type of data to be obtained
7. Identify, interpret and implement relevant laws, regulations and policies related to specific studies and/or programs
8. Plan, incorporate and use appropriate methods for the dissemination and adoption of clinical research findings
9. Manage as a clinical translational research team leader the fiscal, personnel, facilities, regulatory assets and scientific integrity of a funded clinical research program
10. Use knowledge and skills related to leadership, team-building, negotiation, conflict resolution, group process and principles of ethical decision-making to manage a research team and build transdisciplinary collaboration
11. Identify and coordinate institutional resources needed to carry out theoretically based and scientifically sound high-quality funded research
12. Effectively communicate specialist-to-specialist
13. Effectively communicate specialist knowledge to nonspecialists and laypersons

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Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (preferred); rolling admissions	Applications received by Jan 10 receive priority	GRE, TOEFL if relevant

In addition to the general admission requirements of the VCU Graduate School (p. 34) all applicants must provide the following:

1. A statement of purpose for application to the program. The document should be 1.5 or double-spaced with one-inch margins, in a font height no smaller than 11 points. The statement of purpose should cover the following issues in two to five pages:
   a. Why the applicant wishes to pursue a Ph.D. in the Clinical and Translational Sciences with a concentration in cancer and molecular medicine
   b. Background experience relevant to pursuing a Ph.D. in the concentration in cancer and molecular medicine
   c. Research interests and potential faculty mentors with whom the individual would want to work
   d. Description of the applicant's career goals

2. Scores from the Graduate Record Examination (GRE). Applicants **must** score at the 75th percentile or above in all sections of the GRE.
3. International applicants must also provide, to the VCU Global Education Office, scores from the Test of English as a Foreign Language or International English Language Testing System.

Degree requirements

All students are expected to be actively engaged in research throughout the duration of the Ph.D. program. Students are generally admitted under a mentorship model, meaning that they will begin research under the supervision of faculty advisers to whom their research interests most closely align. Other didactic experiences include the weekly seminar series (both at the VIPBG and in external departments) as well as participation in workshops and scientific meetings of relevance to the student's research area.

The curriculum provides a strong grounding in fundamental concepts while emphasizing aspects of research design and technology that are broadly applicable across disciplines in industrial, government and academic settings. A series of elective courses will then provide an advanced base of knowledge focused on a student's areas of interest.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to meet the following:

1. Credit hour requirements: Students are required to complete course work in core and elective courses and to conduct significant research. In order to earn the Ph.D., students must complete a minimum of 54 credit hours: 32 core and elective courses as well as 22 in directed and dissertation research that provide a sound foundation in clinical and translational research principles. Students will also participate in seminar and workshop experiences that place them in the midst of the research process from theoretically based hypothesis generation through grant writing, study conduction, and, ultimately, data analysis and manuscript preparation. This program also includes a rigorous interdisciplinary research component comprising directed research and dissertation hours.
2. Transfer and M.S. credit hours: Graduate-level course work completed prior to matriculation into the program, including course work taken in another program at VCU or at another institution, shall be evaluated to determine whether it can be used to fulfill degree requirements of this program. Transfer of credit hours will be limited to those allowed by the university. A minimum grade of B is required for credit hours to transfer.
3. Grade requirements: Degree applicants must achieve an overall GPA of 3.0 (B) with a grade of C in no more than two courses per the VCU Graduate Bulletin. The GPA for graduation shall be based on all graduate courses attempted after acceptance into the program. Students who receive a grade lower than a B in any of the required core courses will be subject to remedial action as determined by their advisory committee in conjunction with the program director to ensure that there is adequate mastery of the material. All remedial action must be undertaken and completed to the committee's satisfaction before the student is eligible to begin their qualifying exams.
4. Research advisers and committee: The director of the CCTR education program or the director's designee will assist the student with initial course selection and provide advice concerning the program. All students should select their master's or doctoral co-advisers and finalize the composition of their research advisory committee prior to the end of the second semester of study.
5. The student's co-advisers shall provide each student enrolled in the master's or doctoral program with individualized recommendations regarding course work selection, workshop experiences and the direction of their research. It is essential that each student be comprehensively assessed in the area of their methodological and research background. Particularly in the case of those pursuing the Ph.D., recommendations will be made to ensure that each student has acquired the needed substantive research background necessary for doctoral-level work. Thus, the total credit hours required for graduation will be determined on a case-by-case basis by the individual student's research advisory committee.
6. The committee will consist of a minimum of five members, all of whom must be members of the VCU graduate faculty. Note: Individuals who are not already graduate faculty members must apply to the dean of the Graduate School for temporary affiliate membership. The composition of the research advisory committee shall be such that the significant areas of the student's research focus are represented. To foster the interdisciplinary intent of this degree program, at least one member of the committee shall be from a school other than those of the student's co-advisers. Final approval of each student's advisory committee membership shall rest with the CCTR Education Program committee.
7. Admission to candidacy for the Ph.D. Before admission to candidacy for the Ph.D., students must have:
   a. Completed all required course work (as noted above, through a comprehensive screening process students will have been evaluated to assure that they have grounding in a relevant substantive content area and have taken the needed course work in statistics, methodology and research so that they are able to pursue doctoral-level research)
   b. Successfully completed an oral examination
8. Oral examination: Upon successful completion of all required didactic course work, not including seminars and workshops and submission and acceptance of a research proposal, students shall take an oral examination administered by the student's research advisory committee. The exam shall be based on a defense of the student's proposed dissertation research project, which shall be constructed in the format of an NIH grant submission and all other subject areas deemed appropriate by the committee. All advisory committee members must vote on the student's performance as either Pass or Fail. A student may pass the exam with no more than one negative vote. Upon successful completion of the oral examination, the student is officially entered into candidacy and permitted to refine their proposed dissertation research and submit it for final committee approval before initiating the project (see below). An unsuccessful oral examination shall require re-examination within a time period determined by the committee. Only one oral re-examination is permitted.
9. Dissertation research/proposal: Students must propose and conduct a substantial original clinical and/or translational investigation under the supervision of the research advisers and advisory committee. The student can refine the research proposal which served as the foundation of their oral examination in consultation with the research advisers and advisory committee or propose a new novel research proposal. The proposal, which shall be constructed in the format of an NIH grant submission, should include information on the general purpose of the research, background information on the research topic (including a review of the relevant literature), a rationale for the project, a statement of the hypotheses to be investigated or research

questions to be answered, and proposed methods and statistical analyses. Once the student has received the committee's approval, they can initiate their dissertation research.

10. Dissertation research project: The research project should represent a significant contribution to the body of knowledge in its field and should be deemed publishable in refereed journals. The emphasis of the research conducted by students in this program shall be on clinical and translational interdisciplinary research, incorporating two or more disciplines as well as a systems approach. This emphasis will be fostered by the requirement of having at least one faculty member on the research advisory committee from a school or college different from that of the research advisers, thereby exposing students to different perspectives on the same problem and assisting students in developing multidisciplinary approaches to their research.
11. Dissertation defense: Students shall prepare a written dissertation describing the completed research using a format approved by the VCU Graduate School. An oral defense of the dissertation, under the direction of the research advisory committee and open to all faculty members, shall be scheduled to examine the student's research, dissertation documentation and underlying fundamental knowledge across the disciplines encompassed by the student's research. An announcement of the oral defense, including the candidate's name, dissertation title and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense. Following the defense, all committee members shall vote on the acceptability of the dissertation. A student may pass the oral defense, signifying that the research advisory committee has accepted the dissertation, with no more than one negative vote. Upon successful completion of the defense and dissertation, the student may apply for graduation from Virginia Commonwealth University with the degree of Doctor of Philosophy in Clinical and Translational Sciences.

Research advisers and committee

Each student in the program will have both a research and a clinical mentor (these could be the same or different faculty members). This team-based mentoring approach will facilitate the translational aspects of the Ph.D. students' projects and may actually serve to stimulate new translational projects and collaborations at VCU. The research mentors in the program will be chosen based on demonstrated research expertise in the area of cancer or molecular medicine, excellent mentoring skills, and research funding to support the Ph.D. student. Clinical mentors will be chosen based on clinical expertise and mentoring excellence. Through the clinical mentor, the trainee will have opportunities to be exposed to clinical practice, including clinics and surgeries, clinical laboratories, the complexities of clinical trials, and other clinical activities. The clinical activities are expected to consist of approximately one hour/week on average for Ph.D. students, but would be more intensive for M.D./Ph.D. students, in keeping with the existing requirements for that program. Both the research and clinical mentor would be on the thesis committee, which would comprise a total of five faculty members, at least three of whom are CMM faculty members. For M.D./Ph.D. students, their clinical mentors will be the same faculty member serving as their Foundations of Clinical Medicine preceptors. The students' mentors and thesis committee will advise the students as they prepare career development plans in the second year in the program. The career development plan will be required because translational science is by definition an interdisciplinary and novel career path for students.

Qualifying examination

Students in good academic standing who have completed all of their required academic core course work will spend the summer after the second year preparing for the qualifying exam. The qualifying exam will consist of writing a review paper of no more than 30 double-spaced pages, excluding references. In keeping with the interdisciplinary nature of the program, the review paper must demonstrate mastery across the core areas represented in CCM. The topic of the review paper should be developed by students in consultation with their advisers. The title of the review paper, along with a short abstract (no longer than one single-spaced page) describing the proposed content should be submitted to the concentration program director by June 15 for review by the qualifying exam committee. The QEC will review the proposal to ensure that the topic of the review paper is appropriate in that it allows the student to demonstrate command of the literature and interdisciplinary breadth. The committee will make decisions about adequacy of the review paper and, if necessary, work with the student to make revisions within approximately 14 days. Once the topic has been approved by the QEC, the student may begin writing. The review paper must be the student's own work. Drafts may not be reviewed by the student's adviser or other faculty, fellows or students. The final review paper must be submitted to the advisory committee by Aug. 1.

An oral examination of the paper administered by the student's advisory committee and the QEC must be scheduled to take place approximately two weeks after submission to evaluate the student's command of the material and to give the committee opportunity to ask questions and provide feedback. A pass/fail decision will be made at that time. Unsuccessful completion of the qualifying exam will require re-examination within a period of time determined by the committee and the program director. The content of the re-examination will also be determined by the committee and program director on an individual basis. In some cases this could involve a revision of the review paper or particular sections; in other cases, it may involve a repeat of the entire process including selection of a new topic and submission of a new review paper and/or repeat of the oral defense. Only one reattempt to pass qualifying exams is permitted. Students who do not pass their qualifying exams upon their second attempt will be dismissed from the program. Upon successful completion of the oral examination, the student is then officially entered into candidacy for the Ph.D. and permitted to refine their proposed dissertation research and submit it for final committee approval before initiating the project (see below).

Admission to Ph.D. candidacy

Students will have written and oral qualifying examinations, based on writing a grant proposal describing their proposed thesis research and orally defending the proposal with their thesis committee. Before admission to candidacy for the Ph.D., students must have (1) completed all required course work as described above and (2) successfully completed a qualifying exam.

Dissertation proposal defense

Students who have completed the qualifying exam and the second year project are eligible to propose and defend their dissertation. The proposal should be constructed in the format of an NIH grant submission. The proposal must consist of an original research idea generated by the student in consultation with their adviser. The dissertation proposal defense should generally be completed during the fall semester of the third year. Students shall prepare a written dissertation describing the completed research using a format approved by the VCU Graduate School. An oral defense of the dissertation, under the direction of the research advisory committee and open to all faculty members, shall be scheduled to examine the student's research, dissertation documentation and underlying fundamental knowledge across the disciplines encompassed by the student's research. An announcement

of the oral defense, including the candidate's name, dissertation title, and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Following the defense, all committee members shall vote on the acceptability of the dissertation. A student may pass the oral defense, signifying that the research advisory committee has accepted the dissertation, with no more than one negative vote. Upon successful completion of the defense and dissertation, the student may apply for graduation from Virginia Commonwealth University with the degree of Doctor of Philosophy in Clinical and Translational Sciences with a concentration in cancer and molecular medicine.

Time limit

All requirements for the Ph.D. must be completed within eight years from the date of admission to the degree program.

Concentration in cancer and molecular medicine

The concentration in cancer and molecular medicine is a translational and interdisciplinary Ph.D. curriculum in the Center for Clinical and Translational Research. The goal of the program is to train students to perform translational research in cancer and molecular medicine. This requires a background and the necessary vocabulary to communicate with both scientists and clinicians and the research skills to be able to bridge bench science and clinical science. The marriage of cancer and molecular medicine blends established cancer biology with an emerging field, molecular medicine. The CMM concentration serves as an educational program for Ph.D. as well as M.D./Ph.D. students encompassing the research objectives of the VCU Massey Cancer Center, the VCU Institute of Molecular Medicine and the CCTR.

In addition to the core courses, elective courses will be recommended to Ph.D. students based on their research. Students will develop an individualized curriculum with the guidance of the program director, based on their research interests and career goals. By the end of the first semester, each student will develop a complete curriculum plan, to be approved by the program director. This will be reviewed by the student's thesis committee in the second fall semester.

Curriculum requirements

Required courses

Course	Title	Hours
ANAT 620	Scientific Writing and Grantsmanship	2
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
CCTR 520	Fundamentals of Research Regulation	2
CCTR 630	Design Implications in Clinical Trials	3
or BIOS 571	Clinical Trials	
CCTR 631	Adaptive Clinical Trials	1
CCTR 640	Team Science: Theories and Practice	2
CCTR 690	Research Seminar in Clinical and Translational Sciences	4
CCTR 801	Clinical Practicum	2
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Total Hours		20

Electives

Course	Title	Hours
Select 12 credit hours of the following (chosen with approval of research advisory committee):		12
BIOC 503	Biochemistry, Cell and Molecular Biology	
BIOC 504	Biochemistry, Cell and Molecular Biology	
BIOC 605	Molecular Biology	
EPID 650	Epidemiologic Methods for Research	
EPID 651	Intermediate Epidemiologic Methods for Research	
EPID 652	Advanced Epidemiologic Methods and Data Analysis	
HGEN 614	Pathogenesis of Human Genetic Disease	
MICR 684	Molecular Biology of Cancer	
PHTX 606	Introduction to Pharmacology of Therapeutic Agents	
Total Hours		12

Research

Course	Title	Hours
CCTR 697	Directed Research in Clinical and Translational Sciences [1]	22
Total Hours		22

[1] Course must be taken for a minimum of 22 credits.

Total graduate credit hours required (minimum) 54

Graduate program director
Teraya Donaldson, Ph.D.
Assistant director of education
Center for Clinical and Translational Research
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Additional contact
T'Keyah Johnson
Education coordinator
Center for Clinical and Translational Research
johnsontc3@vcu.edu
(804) 628-5414

Program website: cctr.vcu.edu/education

Clinical and Translational Sciences, Doctor of Philosophy (Ph.D.) with a concentration in psychiatric, behavioral and statistical genetics

Note: Admission to this program is temporarily suspended.

Program goal

The doctoral program in clinical and translational sciences offers a general curriculum, an interdisciplinary concentration in psychiatric,

behavioral and statistical genetics and a concentration in cancer and molecular medicine.

Students who pursue the doctoral program in clinical and translational sciences will be grounded in a relative substantive area and be prepared to integrate data from multiple disciplines, have strong communication and computational skills and be sufficiently flexible to easily move among different projects and research venues.

Student learning outcomes

Students who complete the program should achieve the following core competencies:

1. Understand, integrate and apply relevant biomedical biobehavioral concepts and theoretical frameworks to research
2. Comprehend, select and apply the appropriate study design to address specific health issues
3. Critically review the scientific literature by applying sound research knowledge and principles to the review
4. Apply data collection processes and information technology to create, maintain and secure databases and other information
5. Apply ethical principles to study design, data collection and dissemination
6. Devise an analysis plan (statistical methodology) and analyze data using methods appropriate for the study design and type of data to be obtained
7. Identify, interpret and implement relevant laws, regulations and policies related to specific studies and/or programs
8. Plan, incorporate and use appropriate methods for the dissemination and adoption of clinical research findings
9. Manage as a clinical translational research team leader the fiscal, personnel, facilities, regulatory assets and scientific integrity of a funded clinical research program
10. Use knowledge and skills related to leadership, team-building, negotiation, conflict resolution, group process and principles of ethical decision-making to manage a research team and build transdisciplinary collaboration
11. Identify and coordinate institutional resources needed to carry out theoretically based and scientifically sound high-quality funded research
12. Effectively communicate specialist-to-specialist
13. Effectively communicate specialist knowledge to nonspecialists and laypersons

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Note: Admission to this program is temporarily suspended.

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Ph.D.	Fall (Preferred). Rolling admissions.	Applications received by Jan 10 receive priority	GRE, TOEFL if relevant

In addition to the general admission requirements of the VCU Graduate School (p. 34) all applicants must provide the following:

1. A statement of purpose for application to the program. The document should be 1.5 or double-spaced with one-inch margins, in a font size no smaller than 11 points. The statement of purpose should cover the below issues in two to five pages:
   a. Why the applicant wishes to pursue a Ph.D. in the CTS-PBSG concentration
   b. Background experience relevant to pursuing a Ph.D. in the CTS-PBSG concentration
   c. Research interests and potential faculty mentors with whom the individual would want to work
   d. Description of the applicant's career goals

2. Scores from the Graduate Record Examination (GRE). Applicants **must** score at the 75th percentile or above in all sections of the GRE.
3. International applicants must also provide, to the VCU Global Education Office, scores from the Test of English as a Foreign Language or International English Language Testing System.

Note: Admission to this program is temporarily suspended.

Degree requirements

All students are expected to be actively engaged in research throughout the duration of the Ph.D. program. Students are generally admitted under a mentorship model, meaning that they will begin research under the supervision of faculty advisers to whom their research interests most closely align. Other didactic experiences include the weekly seminar series (both at the VIPBG and in external departments) as well as participation in workshops and scientific meetings of relevance to the student's research area.

The curriculum provides a strong grounding in fundamental concepts while emphasizing aspects of research design and technology that are broadly applicable across disciplines in industrial, government and academic settings. A series of elective courses will then provide an advanced base of knowledge focused on a student's areas of interest.

In addition to general VCU Graduate School graduation requirements (p. 31), students are required to meet the following:

1. Credit hour requirements: Students are required to complete course work in core and elective courses and to conduct significant research. In order to earn the Ph.D., students must complete a minimum of 54 credit hours: 32 core and elective courses as well as 22 in directed and dissertation research that provide a sound foundation in clinical and translational research principles. Students will also participate in seminar and workshop experiences that place them in the midst of the research process from theoretically based hypothesis generation through grant writing, study conduction, and, ultimately, data analysis and manuscript preparation. This program also includes a rigorous interdisciplinary research component comprising directed research and dissertation hours.
2. Transfer and M.S. credit hours: Graduate-level course work completed prior to matriculation into the program, including course work taken in another program at VCU or at another institution, shall be evaluated to determine whether it can be used to fulfill degree requirements of this program. Transfer of credit hours will be limited to those allowed by the university. A minimum grade of B is required for credit hours to transfer.
3. Grade requirements: Degree applicants must achieve an overall GPA of 3.0 (B) with a grade of C in no more than two courses per the VCU Graduate Bulletin. The GPA for graduation shall be based on all graduate courses attempted after acceptance into the program. Students who receive a grade lower than a B in any of the required PBSG core courses will be subject to remedial action as determined by their advisory committee in conjunction with the PBSG program director to ensure that there is adequate mastery of the material. All remedial action must be undertaken and completed to the committee's satisfaction before the student is eligible to begin their qualifying exams.
4. Research advisers and committee: The director of the CCTR education program or the director's assigned designee will assist the student with initial course selection and provide advice concerning the program. All students should select their master's or doctoral co-advisers and finalize the composition of their research advisory committee prior to the end of the second semester of study.
5. The student's co-advisers shall provide each student enrolled in the master's or doctoral program with individualized recommendations regarding course work selection, workshop experiences and the direction of their research. It is essential that each student be comprehensively assessed in the area of their methodological and research background. Particularly in the case of those pursuing the Ph.D., recommendations will be made to ensure that each student has acquired the needed substantive research background necessary for doctoral-level work. Thus, the total credit hours required for graduation will be determined on a case-by-case basis by the individual student's research advisory committee.
6. The committee will consist of a minimum of five members, all of whom must be members of the VCU graduate faculty. Note: Individuals who are not already graduate faculty members must apply to the dean of the Graduate School for temporary affiliate membership. The composition of the research advisory committee shall be such that the significant areas of the student's research focus are represented. To foster the interdisciplinary intent of this degree program, at least one member of the committee shall be from a school other than those of the student's co-advisers. Final approval of each student's advisory committee membership shall rest with the CCTR Education Program committee.
7. Admission to candidacy for the Ph.D. Before admission to candidacy for the Ph.D., students must have:
   a. Completed all required course work (as noted above, through a comprehensive screening process students will have been evaluated to assure that they have grounding in a relevant substantive content area and have taken the needed course work in statistics, methodology and research so that they are able to pursue doctoral-level research)
   b. Successfully completed an oral examination
8. Oral examination: Upon successful completion of all required didactic course work, not including seminars and workshops and submission and acceptance of a research proposal, students shall take an oral examination administered by the student's research advisory committee. The exam shall be based on a defense of the student's proposed dissertation research project, which shall be constructed in the format of an NIH grant submission and all other subject areas deemed appropriate by the committee. All advisory committee members must vote on the student's performance as either Pass or Fail. A student may pass the exam with no more than one negative vote. Upon successful completion of the oral examination, the student is officially entered into candidacy and permitted to refine their proposed dissertation research and submit it for final committee approval before initiating the project (see below). An unsuccessful oral examination shall require re-examination within a time period determined by the committee. Only one oral re-examination is permitted.
9. Dissertation research/proposal: Students must propose and conduct a substantial original clinical and/or translational investigation under the supervision of the research advisers and advisory committee. The student can refine the research proposal which served as the foundation of their oral examination in consultation with the research advisers and advisory committee or propose a new novel research proposal. The proposal, which shall be constructed in the format of an NIH grant submission, should include information on the general purpose of the research, background information on the research topic (including a review of the relevant literature), a rationale for the project, a statement of the hypotheses to be investigated or research

questions to be answered, and proposed methods and statistical analyses. Once the student has received the committee's approval, they can initiate their dissertation research.

10. Dissertation research project: The research project should represent a significant contribution to the body of knowledge in its field and should be deemed publishable in refereed journals. The emphasis of the research conducted by students in this program shall be on clinical and translational interdisciplinary research, incorporating two or more disciplines as well as a systems approach. This emphasis will be fostered by the requirement of having at least one faculty member on the research advisory committee from a school or college different from that of the research advisers, thereby exposing students to different perspectives on the same problem and assisting students in developing multidisciplinary approaches to their research.
11. Dissertation defense: Students shall prepare a written dissertation describing the completed research using a format approved by the VCU Graduate School. An oral defense of the dissertation, under the direction of the research advisory committee and open to all faculty members, shall be scheduled to examine the student's research, dissertation documentation and underlying fundamental knowledge across the disciplines encompassed by the student's research. An announcement of the oral defense, including the candidate's name, dissertation title and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense. Following the defense, all committee members shall vote on the acceptability of the dissertation. A student may pass the oral defense, signifying that the research advisory committee has accepted the dissertation, with no more than one negative vote. Upon successful completion of the defense and dissertation, the student may apply for graduation from Virginia Commonwealth University with the degree of Doctor of Philosophy in Clinical and Translational Sciences with a concentration in psychiatric, behavioral and statistical genetics.

Research advisers and committee

Each student in the program will have both a research and a clinical mentor (these could be the same or different faculty members). This team-based mentoring approach will facilitate the translational aspects of the Ph.D. students' projects and may actually serve to stimulate new translational projects and collaborations at VCU. The research mentors in the program will be chosen based on demonstrated research expertise in the area of cancer or molecular medicine, excellent mentoring skills, and research funding to support the Ph.D. student. Clinical mentors will be chosen based on clinical expertise and mentoring excellence. Through the clinical mentor, the trainee will have opportunities to be exposed to clinical practice, including clinics and surgeries, clinical laboratories, the complexities of clinical trials, and other clinical activities. The clinical activities are expected to consist of approximately one hour/week on average for Ph.D. students, but would be more intensive for M.D./Ph.D. students, in keeping with the existing requirements for that program. Both the research and clinical mentor would be on the thesis committee, which would comprise a total of five faculty members, at least three of whom are CMM faculty members. For M.D./Ph.D. students, their clinical mentors will be the same faculty member serving as their Foundations of Clinical Medicine preceptors. The students' mentors and thesis committee will advise the students as they prepare career development plans in the second year in the program. The career development plan will be required because translational science is by definition an interdisciplinary and novel career path for students.

Qualifying exam

Students in good academic standing who have completed all of their required academic core course work will spend the summer after the second year preparing for the qualifying exam. The qualifying exam will consist of writing a review paper of no more than 30 double-spaced pages, excluding references. In keeping with the interdisciplinary nature of the program, the review paper must demonstrate mastery across the core areas represented in PBSG (genetics, phenotyping, methods). The topic of the review paper should be developed by the students in consultation with their advisers. The title of the review paper, along with a short abstract (no longer than one single-spaced page) describing the proposed content should be submitted to the PBSG program director by June 15 for review by the qualifying exam committee. The QEC will review the proposal to ensure that the topic of the review paper is appropriate in that it allows the student to demonstrate command of the literature and interdisciplinary breadth. The committee will make decisions about adequacy of the review paper and, if necessary, work with the student to make revisions within approximately 14 days. Once the topic has been approved by the QEC, the student may begin writing. The review paper must be the student's own work. Drafts may not be reviewed by the student's adviser or other faculty, fellows or students. The final review paper must be submitted to the advisory committee by Aug. 1.

An oral examination of the paper administered by the student's advisory committee and the QEC must be scheduled to take place approximately two weeks after submission to evaluate the student's command of the material and to give the committee opportunity to ask questions and provide feedback. A pass/fail decision will be made at that time. Unsuccessful completion of the qualifying exam will require re-examination within a period of time determined by the committee and PBSG program director. The content of the re-examination will also be determined by the committee and PBSG program director on an individual basis. In some cases this could involve a revision of the review paper or particular sections; in other cases, it may involve a repeat of the entire process including selection of a new topic and submission of a new review paper and/or repeat of the oral defense. Only one reattempt to pass qualifying exams is permitted. Students who do not pass their qualifying exams upon their second attempt will be dismissed from the program. Upon successful completion of the oral examination, the student is then officially entered into candidacy for the Ph.D. and permitted to refine their proposed dissertation research and submit it for final committee approval before initiating the project (see below).

Admission to Ph.D. candidacy

Students will have written and oral qualifying examinations, based on writing a grant proposal describing their proposed thesis research and orally defending the proposal with their thesis committee. Before admission to candidacy for the Ph.D., students must have (1) completed all required course work as described above and (2) successfully completed a qualifying exam.

Dissertation proposal defense

Students who have completed the qualifying exam and the second year project are eligible to propose and defend their dissertation. The proposal should be constructed in the format of an NIH grant submission. The proposal must consist of an original research idea generated by the student in consultation with their adviser. The dissertation proposal defense should generally be completed during the fall semester of the third year. Students shall prepare a written dissertation describing the completed research using a format approved by the VCU Graduate School. An oral defense of the dissertation, under the direction of

the research advisory committee and open to all faculty members, shall be scheduled to examine the student's research, dissertation documentation and underlying fundamental knowledge across the disciplines encompassed by the student's research. An announcement of the oral defense, including the candidate's name, dissertation title, and the day, place and time of the defense, shall be made at least 10 working days in advance of the defense.

Following the defense, all committee members shall vote on the acceptability of the dissertation. A student may pass the oral defense, signifying that the research advisory committee has accepted the dissertation, with no more than one negative vote. Upon successful completion of the defense and dissertation, the student may apply for graduation from Virginia Commonwealth University with the degree of Doctor of Philosophy in Clinical and Translational Sciences with a concentration in psychiatric, behavioral and statistical genetics.

Time limit

All requirements for the Ph.D. must be completed within eight years from the date of admission to the degree program.

Concentration in psychiatric, behavioral and statistical genetics

The concentration in psychiatric, behavioral and statistical genetics was designed by faculty at the Virginia Institute for Psychiatric and Behavioral Genetics. This interdisciplinary institute brings together faculty with a wide range of scientific backgrounds ranging from statistical and molecular genetics to epidemiology, psychology and psychiatry, all with the joint focus of understanding how genetic and environmental factors impact the development of psychiatric and substance use disorders and related behavioral outcomes.

Faculty members work across twin and family studies, gene identification projects and genetically informative longitudinal, community-based samples. Faculties also are involved in statistical methods development for these projects. Students in the PBSG concentration obtain interdisciplinary training with course work in human genetics, psychology/psychiatry, biostatistics and epidemiology. Students can tailor their training and research experience to their particular career goals by selecting electives in their focused area of interest.

First-year project

All students are required to conduct a first-year research project. The nature of the first-year project will vary according to the area of the student's research. This project must be written up by the student and submitted to the PBSG program director and it must follow a scientific paper format and include an abstract, introduction, methods, results and discussion sections. The depth of the individual sections of the project will vary according to the nature of the project. Although the write-up of the first-year project is not required to be of publication quality, it should demonstrate a basic command of the research process and an ability to integrate relevant literature and nascent data into testable hypotheses. The adviser and PBSG program director will review, consult and make a decision about the adequacy of the submitted first-year project write-up. Feedback will generally be given within 14 days of receipt of the write-up. Students cannot move on to the second-year project until the first-year project has been signed off on by the adviser and PBSG program director. Students must give a presentation as part of the VIPBG seminar series on their first-year projects at some point during the spring semester of the first year. Students should aim to submit their written first-year projects prior to the start of the fall semester of the second year of graduate study.

Second-year project

The second-year research project can be a continuation/extension of the first-year project or consist of a new research question. The second-year project should be developed in collaboration with the student's advisory committee. This should happen soon after the first-year project has been signed off on (if not before). Students must give a presentation on their second-year projects at some point during the spring semester of the second year. Second-year projects are expected to be of publication quality and should follow a scientific paper format, which includes an abstract, introduction, methods, results and discussion sections. The advisory committee and PBSG program director will review, consult and make a decision about the adequacy of the second-year project, generally within 14 days of its receipt. Students cannot progress to the oral defense of the dissertation proposal until the second year-project has been signed off on by the advisory committee and PBSG program director. Students should aim to have their second-year projects completed early in the fall semester of their third year of graduate study.

Curriculum requirements

Required courses (29-32 credit hours)

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
or STAT 543	Statistical Methods I	
BIOS 544	Graduate Research Methods II	3
or STAT 544	Statistical Methods II	
CCTR 690	Research Seminar in Clinical and Translational Sciences	1
EPID 571	Principles of Epidemiology	3
HGEN 501/BIOL 530	Introduction to Human Genetics	3
HGEN 502	Advanced Human Genetics	3
HGEN 603	Mathematical and Statistical Genetics	3
HGEN 620	Principles of Human Behavioral Genetics	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
PSYC 616	Psychopathology	1,3
PSYC 691	Special Topics	1-3
PSYC 700	Grant Writing	3

Electives (variable)

A minimum of three elective courses must be taken and can be selected from the range of classes available across VCU departments, including the departments of Psychology, Human and Molecular Genetics, Biostatistics and/or any other relevant course that fits with the student's primary focus and interests, in consultation with the student's research advisory committee.

Research (variable)

Course	Title	Hours
CCTR 697	Directed Research in Clinical and Translational Sciences	1-15
CCTR 898	Dissertation Research in Clinical and Translational Sciences	1-10

Total graduate credit hours required (minimum) 54

Graduate program director
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Education coordinator
Center for Clinical and Translational Research
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(804) 628-5414

Program website: cctr.vcu.edu/education (http://www.cctr.vcu.edu/education)

Clinical and Translational Sciences, Master of Science (M.S.)

Program goal

The Master of Science in Clinical and Translational Sciences program provides training and mentoring for a new generation of investigators who, regardless of primary areas of interest, will be able to understand the methods and techniques used along the pathway from the bench to the bedside, to the community and beyond. The program emphasizes the importance of interdisciplinary approaches to research.

Student learning outcomes

1. Understand, integrate and apply relevant biomedical biobehavioral concepts and theoretical frameworks to research
2. Comprehend, select and apply the appropriate study design to address specific health issues
3. Critically review the scientific literature by applying sound research knowledge and principles to the review
4. Apply data collection processes and information technology to create, maintain and secure databases and other information
5. Apply ethical principles to study design, data collection and dissemination
6. Devise an analysis plan (statistical methodology) and analyze data using methods appropriate for the study design and type of data to be obtained
7. Identify, interpret and implement relevant laws, regulations and policies related to specific studies and/or programs
8. Plan, incorporate and use appropriate methods for the dissemination and adoption of clinical research findings
9. Manage as a clinical translational research team leader, including the fiscal, personnel, facilities, regulatory assets and scientific integrity of a funded clinical research program
10. Effectively communicate specialist-to-specialist
11. Effectively communicate specialist knowledge to nonspecialists and laypersons

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.S.	Fall	June 15	None

In addition to the general admission requirements of the VCU Graduate School (p. 34), please note the following:

1. Enrollment is open to VCU junior faculty or residents only.
2. Applicants should be early stage investigators or residents with terminal degrees (e.g. M.D., Ph.D., D.D.S., Sc.D., D.V.M., Ed.D., Pharm.D.).
3. Applicants should have a targeted research interest that is explained in a personal statement accompanying the graduate application.
4. A letter of support from the applicant's department chair is mandatory.
5. A letter of commitment from an academic adviser is mandatory.

Degree requirements

In addition to the VCU Graduate School graduation requirements (p. 31), the master's degree can be earned upon completion of 30 credit hours that combine didactic course work and directed research, including a master's capstone project in the form of a peer-reviewed journal article or a grant proposal.

The program provides a sound foundation in clinical and translational research principles and thereby prepares the student to engage in many components of investigative processes. Students are expected to attend the research seminar course each semester they are in the program (and register for the course a minimum of three times) in order to stay abreast of current health and human services research and to develop their communication skills. Additionally, students must complete a course on responsible conduct of research and scientific integrity, which will ensure that students understand the broad ethical implications of biobehavioral and biomedical research, understand what constitutes scientific fraud and misconduct and are aware of their responsibilities as scientists.

When students have reached 27 credit hours of didactic and research course work, they must register for CCTR 700, which may be in one of two forms: an NIH-style grant proposal or a peer-reviewed journal article ready for submission.

This project will be overseen and reviewed by the student's research advisory committee. Students are expected to present their final projects to the committee for acceptance.

Curriculum requirements

Course	Title	Hours
BIOS 543	Graduate Research Methods I	3
BIOS 544	Graduate Research Methods II	3
CCTR 520	Fundamentals of Research Regulation	2
CCTR 630	Design Implications in Clinical Trials	3
CCTR 631	Adaptive Clinical Trials	1
CCTR 690	Research Seminar in Clinical and Translational Sciences (one credit, taken for two semesters)	2
CCTR 697	Directed Research in Clinical and Translational Sciences	9
CCTR 700	Master's Capstone Project	3
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Elective		3
Total Hours		30

Electives

Course	Title	Hours
Examples of potential electives include but are not limited to:		
ANAT 615	Techniques in Neuroscience and Cell Biology	
ANAT 620	Scientific Writing and Grantsmanship	
BIOC 530	Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function	
BIOC 532	Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology	
BIOS 668	Statistical Methods for High-throughput Genomic Data II	
BNFO 621	Business and Entrepreneurship Essentials for Life Scientists	
CCTR 640	Team Science: Theories and Practice	
CCTR 801 & CCTR 802 & CCTR 803	Clinical Practicum and Research Practicum I and Research Practicum II	
EPID 571	Principles of Epidemiology	
EPID 603	Public Health Policy and Politics	
EPID 606	Epidemiologic Methods	
MEDC 530	Bioinformatics and Genomics in Drug Research	
NURS 773	Perspectives on Research Design	

Total graduate credit hours required (minimum) 30

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Program website: cctr.vcu.edu/education (http://www.cctr.vcu.edu/education)

VCU HEALTH SCIENCES

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Richmond, Virginia 23298-0549
healthsciences.vcu.edu (http://healthsciences.vcu.edu)

Marsha Rappley, M.D.
Vice president for health sciences

The mission of the Office of the Vice President for Health Sciences is to provide leadership, resource management counsel and programmatic oversight to the VCU health sciences schools and Massey Cancer Center.

The core values of the office are evidence-based decision-making; novelty; collaboration; diversity, as a facilitator of a culturally competent workforce; and responsible and transparent business practices.

Located on VCU's MCV Campus in Richmond, and in partnership with the VCU Health System, the vice president for health sciences oversees the five health sciences schools (Allied Health Professions, Dentistry, Medicine, Nursing and Pharmacy) as well as the VCU Massey Cancer Center. Areas of responsibility include academic affairs, academic and research space management, financial and administrative affairs, and interprofessional education and collaborative care.

More than 4,200 students each year participate in more than 50 degree programs offered at the undergraduate, graduate and first-professional levels as well post-baccalaureate and post-master's certificate programs. As a growing academic health sciences center, VCU Health Sciences maintains an aggressive research portfolio. Total research awards amounted to approximately $151.5 million in fiscal year 2015, which represented approximately 56 percent of the university's total research awards.

VCU Health Sciences is committed to educational programs directed toward providing graduates capable of meeting the commonwealth's health care needs. Programs are dedicated to maintaining and updating the competency of health professionals in addition to preparing graduates to enter health professions. The educational programs are supported by an institutional commitment to effective teaching and by the 865-bed teaching hospital. The office is committed to providing the very best in education, research and practice for the expansion of science and health care for Virginians and the growing global community.

Care Coordination, Certificate in (Post-baccalaureate graduate certificate)

Program mission

The mission of the VCU Center for Interprofessional Education and Collaborative Care is to improve health through collaboration by:

1. Implementing interprofessional models of care that advance patient and population health
2. Promoting research-driven innovations in interprofessional education and practice
3. Educating students and practitioners to lead in an evolving interprofessional health care environment

The center's vision is to become a national model for transforming communities and health care through innovations in education, scholarship and practice focused on increasing interprofessional care.

Program goals

Students in the care coordination certificate program will integrate concepts of care coordination in an interprofessional context along the full continuum of health care to meet the needs of patients and their families as they transition between health care settings and seek to maintain optimum health. Graduates will be equipped to help patients of any age who are at high risk for excess use of health care services and who have the potential for adverse health outcomes.

Student learning outcomes

Graduates will be able to:

1. Explain ways the health care team can empower the patient and/or family with decision-making skills about the patient's health care needs by keeping patients and families central in the care planning process
2. Apply ethical principles to the care of patients of all ages and their families
3. Compare and contrast methods of effective care coordination in a variety of clinical settings to minimize cost and enhance health outcomes
4. Develop and demonstrate skills for effective communication and collaboration within the interprofessional team and across settings
5. Describe approaches to link complex patients with community resources that promote social justice and health
6. Develop and demonstrate skills to effectively facilitate and utilize timely, complete, effective and safe handoffs during care transitions for complex patients
7. Demonstrate how to maximize the utility of information systems to enhance care
8. Explain the overall infrastructure and regulation of U.S. health care and its effect on care coordination
9. Compare and contrast health care payment models as they relate to utilization review, compliance and reimbursement.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the **Graduate School website** and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
Certificate	Fall	May 15	

In addition to the general admission requirements of the VCU Graduate School (http://www.pubapps.vcu.edu/Bulletins/prog_search/?uid=10045&iid=30033&did=20062), the following requirements represent the standards for admission. An applicant must:

1. Be a health care professional, such as registered nurse, social worker, pharmacist, clinical psychologist, physician, therapist (P.T./O.T./S.T.) or professional counselor (The applicant must be in good standing with their own health-related discipline.)
2. Have a bachelor's degree (or equivalent) from a U.S.-accredited program with a health care-related focus such as in nursing, social work, pharmacy, psychology, medicine, allied health or counseling
3. Have preferably one year of clinically based experience (which may include student internships)
4. Submit a resume or vita that includes all relevant information, professional designations and licensure, as applicable
5. Complete the electronic submission of the online VCU Graduate Application (http://graduate.vcu.edu) as well as all supplemental application materials and required documents by the listed deadline

Note: A personal interview may be requested.

Degree requirements

In addition to general VCU Graduate School graduation requirements (p. 31), a candidate for the Certificate in Care Coordination must be recommended by the faculty and must:

1. Meet academic requirements of the Graduate School
2. Complete all courses in this certificate program, achieving at minimum 15 total credit hours, within five academic years of the first registration work to be credited toward the degree
3. Earn a minimum grade of B or pass grade in all courses
4. Earn a minimum cumulative grade-point average of 3.0 on a 4.0 scale in all work presented for graduation
5. Conform to university policies in respect to pass/fail grading for course work
6. Complete capstone project and present findings at completion of the program

The degree will be granted only after all requirements have been fulfilled and all fees to the university have been paid. Degrees are not granted in absentia unless written request is made to the assistant vice president of health sciences for interprofessional education and collaborative care and permission is granted.

Curriculum requirements

Course	Title	Hours
IPEC 510	Interprofessional Communication and the Care Coordinator I	1
IPEC 511	U.S. Health Care and Care Coordination	2
IPEC 512	Health Care Payment Models and Care Coordination	3
IPEC 513	Ethical and Legal Considerations in Care Coordination	2
IPEC 514	Hospital-based Care Coordination	3
IPEC 515	Interprofessional Communication and the Care Coordinator II	1
IPEC 516	Community-based Care Coordination	3
Total Hours		15

Total graduate credit hours required (minimum) 15

Typical plan of study

Many students often end up taking more than the minimum number of hours required for a degree program. The total number of hours may vary depending upon the program, the nature of research being conducted by a student, or in the enrollment or funding status of the student. Students should refer to the program website and talk with their graduate program directors or advisers for information about typical plans of study and registration requirements.

Graduate program director
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Additional contact
Alan Dow, M.D.
Professor and assistant vice president of health sciences for interprofessional education and collaborative care

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Program website: ipe.vcu.edu (http://ipe.vcu.edu)

GRADUATE SCHOOL

Graduate programs are administered by the individual departments, schools and centers with assistance from the Graduate School. Major coordination of the various degree programs is performed by the University Graduate Council, which is chaired by the dean of the Graduate School. The University Graduate Council comprises two elected faculty members from each school and one elected faculty member from VCU Life Sciences.

The Graduate School section of the VCU Bulletins documents the official admission and academic rules and regulations that govern graduate education at the university. The University Graduate Council determines these policies.

Bulletins and course descriptions for the current and past years are now archived in the VCU Scholars Compass (http://scholarscompass.vcu.edu/vcubulletins) hosted by the VCU Libraries.

Graduate programs

In-depth descriptions of all graduate programs at VCU are provided in the individual school and program sections of this bulletin. The Graduate School website (http://www.graduate.vcu.edu) provides links and contact information for all graduate programs offered at VCU. The website also provides updates that occur throughout the academic year, as well as the Application to Graduate Study and complete instructions for applying to all graduate programs.

Refer to the program index for a complete listing of all graduate programs, as well as application deadline dates, and special admission requirements and contact information. Applicants are encouraged to contact the school/department sponsoring the intended program of study at the telephone numbers and/or email addresses provided. Other important contact information is provided on the Graduate School (http://www.vcu.edu/graduate) website as well.

Interdisciplinary Studies, Master of (M.I.S.), individual program of study

The Master of Interdisciplinary Studies (M.I.S.) degree program provides an opportunity for the highly motivated student to pursue a unique course of study that combines graduate course work in a learner-centered approach to graduate education. The student is an active participant in proposing a curriculum that supports an individualized and scholastically rigorous academic goal in a clearly defined, multidisciplinary program. To expand the program's range of options and interdisciplinary perspectives, the program allows for cooperative ventures with other approved colleges and universities.

Program goals

1. To provide the highly motivated graduate student with the opportunity to develop and complete an individualized and learner-centered course of study that combines graduate course work in multiple academic disciplines in order to meet a unique scholarly goal
2. To provide skills required for a wide range of positions or for further advanced study
3. To provide for the student's mastery and synthesis of course content in the academic focus areas, culminating in the design, implementation, interpretation and communication of the results of a capstone research project related to the scholarly goal of the student's interdisciplinary course of study

Student learning outcomes

1. Students must demonstrate general knowledge and synthesis of two or more academic focus areas combined in an approved interdisciplinary course of study with relevant electives, research methodology and independent study through mastery of individual course work and the synthesis of that course work into a final research project.
2. Students must demonstrate oral and written communication skills to convey effectively the assimilated, synthesized knowledge gained from their interdisciplinary study.
3. Students must demonstrate the ability to design and conduct an independent research project or study that exhibits skills of synthesis, analysis and critical thinking, that is directly related to the purpose of the unique scholarly goal identified as part of the admissions process and that is reflected in the academic focus areas in the approved course of study.
4. Students must demonstrate the achievement of an appropriate level of competence in the ability to design and develop the research protocol and to evaluate and present the outcomes.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs

The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (p. 17)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (p. 26)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (p. 31)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu)**.**

Admission requirements

Degree:	Semester(s) of entry:	Deadline dates:	Test requirements:
M.I.S.	Fall	Apr 1	GRE

Special requirements

- Applicants must schedule a preliminary advising interview with the director of the M.I.S. program and complete a preliminary curriculum proposal.

In addition to the general admission requirements of the VCU Graduate School (p. 34), applicants who are proposing an individualized course of study must:

1. Schedule a preliminary advising interview with the director of the M.I.S. program to discuss academic goals and curricular proposals.
2. Submit satisfactory scores on the Graduate Record Examination from a current test (fewer than five years old). Substitutions of other standardized test scores may be made on a case-by-case basis, depending upon the focus areas identified in the curriculum proposal and the approval of all members of the admission committee.
3. Articulate in the written statement of intent, including:
   a. The applicant's academic goal
   b. How the M.I.S. degree program will facilitate the achievement of that goal
   c. How a more traditional program does not meet those goals
4. Complete a preliminary curriculum proposal form identifying the specific course work that will support the academic goal articulated in the written statement of intent. This form is available from the Graduate School by sending an email request to: gradschool@vcu.edu.
5. Students who are interested in working toward a degree are encouraged to apply to the program as early as possible, since a maximum of six credit hours taken as a nondegree-seeking student may be counted toward the degree.

Members of the admission committee include the directors of graduate study of the two focus areas identified in the curriculum proposal and the director of the M.I.S. program.

Degree requirements

In addition to the general VCU Graduate School graduation requirements (p. 31), students who are admitted to the M.I.S. individual program of study concentration must:

1. Obtain approval for all transfer and elective course work as part of the formal advising process for developing and/or changing the approved curriculum plan
2. Identify two focus areas and complete nine to 15 graduate credit hours in each
3. Complete a minimum of three graduate credits in a research methods course relevant to the final research project before beginning the final research project
4. Be approved for degree candidacy before beginning the final research project
5. Complete three to six graduate credits as part of the final research project in the form of an approved directed research, independent study, special project or thesis
   a. A student who chooses the thesis option must identify a thesis adviser and committee before beginning formal work on the thesis. The student will follow the thesis guidelines of the school/program of the thesis adviser, as well as the general guidelines for completion of theses/dissertations (http://www.graduate.vcu.edu/student/thesis.html) as prescribed by the VCU Graduate School, the University Graduate Council and VCU Libraries.
   b. A student who chooses the directed research option must obtain formal approval for the final research project. Before beginning formal work on the final directed research project, the student must submit to the director of the M.I.S. program a copy of the proposed project, along with a signed copy of the Final Project Proposal Approval form (available from the M.I.S program director).

Curriculum requirements

All course work and any substitutions must be approved by the M.I.S. graduate program director.

Course	Title	Hours
Focus area I		9-15
Focus area II		9-15
Electives (additional related course work)		0-12
Research methods (relevant to final research project)		3
Final research project		3-6
GRAD 697	Directed Research	

Total graduate credit hours (minimum) 36

Graduate program director
Mark J. Schaefermeyer, Ph.D.
Associate dean, Graduate School
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(804) 828-4696

Graduate School Mentorship Program

The Graduate School Mentorship Program matches undergraduate and graduate students in mentoring relationships. The goals of the program are twofold: first, to expose undergraduate students to the graduate experience as they consider options and make decisions about post-baccalaureate study and as they transition from undergraduate to graduate student status, and secondly, to provide graduate students with the opportunity to develop mentoring skills as they share their own personal experiences with the undergraduate participants in the program. Complete information about the program is available on the Graduate School website at graduate.vcu.edu/development/mentorship.html (http://www.graduate.vcu.edu/development/mentorship.html).

Leaders and Entrepreneurs Academy for Professional Development

In 2011, VCU finalized its six-year strategic plan, Quest for Distinction (http://www.future.vcu.edu/plan). Explicit within the first theme, to "become a leader among national research universities in providing all students with high-quality learning/living experiences focused on inquiry, discovery and innovation in a global environment," are several goals related to preparing students appropriately for careers in the 21st century. The Leaders and Entrepreneurs Academy for Professional Development is a new initiative sponsored by the VCU Graduate School. A companion to the Preparing Future Faculty Program, LEAPD will offer a series of short courses and experiences to assist graduate students seeking careers in industry, nonprofit organizations, health care, public service and government. Areas of study will include: how to start your own business, career search and networking skill-building, what does it mean (and take) to be a leader, enhancing communication skills, resume writing, negotiation skills, and opportunities for discovering alternative career paths for your chosen program of study. LEAPD is open to all graduate students. For more information contact the VCU Graduate School at (804) 828-2233 or visit graduate.vcu.edu/development/leaders.html (http://www.graduate.vcu.edu/development/leaders.html).

Preparing Future Faculty Program

The Graduate School at VCU is committed to providing graduate students with ongoing opportunities for academic and professional development. Working with graduate faculty and academic graduate program directors, and with academic and administrative support from across the university, the Graduate School strives to identify, support and sponsor initiatives that will prepare the next generation of the professoriate.

In conjunction with the Center for Teaching Excellence, the Graduate School sponsors the Preparing Future Faculty Program for graduate students interested in pursuing teaching careers in academe. Complete information about the program is available on the Graduate School website at graduate.vcu.edu/development/faculty.html (http://www.graduate.vcu.edu/development/faculty.html).

VCU Broadening Experiences for Scientific Training

VCU Career Services
Box 842007
Richmond, Virginia 23284-2007
Phone: (804) 828-1645
careers (careers@vcu.edu)@vcu.edu

VCU BEST seeks to transform the culture of biomedical scientist training at VCU by developing AEGDS, a training platform that broadens student awareness of potential careers, provides opportunities to experience career paths, provides guidance for career paths(s) selection, allows students to develop the skill sets necessary to be successful and encourages students to share their experiences, thereby broadening exposure of others in the community.

Objectives

1. Create an innovative student/postdoctoral professional and personal development program that puts student on an optimized, individualized career path that incorporates their strengths and personal goals
2. Build a sustainable program that builds on existing/volunteer faculty and resources and unique training opportunities already in place at VCU (Each participating unit will be counseled in mechanisms to sustain and continue the program after the funding period in collaboration with a campus steering committee.)
3. Develop mechanisms to engage the entire VCU community, as well as alumni, and community partners — alumni engagement/participation, providing and encouraging interdisciplinary participation throughout schools/programs and with partner organizations, seminars for campus community
4. Empower students to engage and take responsibility for their future, improve self-knowledge and self-management, and to mentor others to do the same
5. Perform ongoing evaluation to optimize the program and ensure that it continues to meet the needs of trainees and mentors

Requirements

Course	Title	Hours
Required courses		
Select two from:		
GRAD 611	Professional and Personal Development	2
GRAD 615	Biomedical Science Careers Seminar Series	1
GRAD 617	Biomedical Sciences Projects in the Community	2
Career or skills electives		
Select three credit hours from:		
GRAD 610	Career Planning for Graduate Students	1
GRAD 612	Oral Presentation Skill-building for Career Professionals	1
GRAD 614	Introduction to Grant Writing	1
GRAD 616	Becoming an Entrepreneur	1

In addition, each student seeking the certificate of achievement will participate in vocational counseling and a monthly meeting with their mentor or peer group.

DIVISION OF COMMUNITY ENGAGEMENT

901 West Franklin Street
Box 843062
Richmond, Virginia 23284-3062
Phone: (804) 828-8848
Fax: (804) 828-2756
community.vcu.edu (http://www.community.vcu.edu)

Catherine W. Howard, Ph.D.
Vice provost, Division of Community Engagement

The Division of Community Engagement mobilizes university-community partnerships that generate innovative solutions to societal challenges and prepares the engaged citizens of tomorrow. In advancing VCU's mission and strategic plan, Quest for Distinction, the office:

- Facilitates and coordinates innovative academic programs, on and off campus, to enhance the community's access to VCU
- Supports the involvement of faculty and students throughout the university in community partnerships
- Creates opportunities for interdisciplinary, community-based collaborations that integrate research, teaching and service

The Division of Community Engagement resides within the Office of the Provost and Vice President for Academic Affairs and serves as the university's central home for community engagement. Community-engaged teaching, including programs such as ASPiRE and service-learning, connects students and faculty with activities that address community-identified needs through mutually beneficial partnerships that deepen students' academics and civic learning. Community-engaged outreach actively enlists students, faculty and community members in efforts to identify social issues and provide innovative solutions. The Mary and Frances Youth Center and the VCU AmeriCorps and America Reads programs serve as models of developing and sustaining high-impact community-university partnerships. Community-engaged research is a collaborative process between the researcher and community partner that creates and disseminates knowledge and creative expression with the goal of contributing to the discipline and strengthening the well-being of the community.

Service-learning

Service-learning integrates community service with traditional academic courses in order to enhance academic learning, facilitate the development of students into responsible citizens and meet community-identified needs. Each student participates in organized service activities that directly relate to the subject matter of the course and which meet community-identified needs. The students then participate in reflection activities, which are designed to increase their understanding and application of course content and enhance their sense of civic responsibility. The community organization defines the service need and the students learn and grow from their service through reflection on their experience. A listing of service-learning courses is provided in the Schedule of Classes (http://www.pubapps.vcu.edu/scheduleofclasses) each semester. For more information, call (804) 827-8215 or visit servicelearning.vcu.edu (http://www.servicelearning.vcu.edu).

VCU America Reads

The America Reads initiative began as a challenge put forth by former President Bill Clinton to "ensure that every child can read independently by third grade." Citizens from across the nation and all walks of life have answered the call to improve the literacy skills of struggling readers. VCU has responded to the challenge by setting aside college work-study funds for eligible students who want to make a difference in the life of a child.

The VCU America Reads program is a sister program to the VCU AmeriCorps program that places college work-study students in local elementary schools to provide comprehensive reading support to students who are below grade level in reading.

Applicants can apply through the VCU work-study jobs portal on the Financial Aid website at finaid.vcu.edu/federalworkstudy (http://finaid.vcu.edu/federalworkstudy). Applicants may also apply directly to the VCU America Reads Program at community.vcu.edu/outreach/america-reads/eligibility-requirements-and-application (http://community.vcu.edu/outreach/america-reads/eligibility-requirements-and-application).

VCU AmeriCorps

AmeriCorps (http://www.nationalservice.gov/programs/americorps) is a national service corps of more than 75,000 members that provides adults of all ages a chance to make a difference in local communities across the United States through one year of service. Members work together to address a community-identified need in critical areas like education, homelessness, disaster relief and organizational capacity.

VCU AmeriCorps is the largest and longest-running AmeriCorps program in Virginia. Established in 1995, the VCU AmeriCorps program has an educational focus with the goal of helping improve the literacy skills of children in grades K-3 attending Richmond Public Schools.

Applications are available beginning in March at community.vcu.edu/outreach/americorps/eligibility-and-application (http://community.vcu.edu/outreach/americorps/eligibility-and-application).

For additional information on the division's programs, visit community.vcu.edu (http://www.community.vcu.edu).

DIVISION OF STRATEGIC ENROLLMENT MANAGEMENT

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sem.vcu.edu (http://www.sem.vcu.edu)

Tomikia P. LeGrande, Ed.D.
Vice provost, Division of Strategic Enrollment Management

The Division of Strategic Enrollment Management (http://www.sem.vcu.edu) provides primary oversight for the recruitment, retention and graduation of students at all levels. The purpose of the division is to ensure academic quality and student success, which is dependent upon the recruitment, retention and timely graduation of a talented and diverse student body. The division's goals and aspirations are clearly articulated in the university's strategic plan, and a primary component of that vision is to ensure that the university attracts and retains students who will graduate at a higher rate and who will contribute to a highly skilled 21st-century workforce.

Within the division there are several operational areas: Admissions, Financial Aid, Intersession, Records and Registration, Student Accounting, the Student Services Center, Summer Studies, and Trio Student Support Services.

For more information, please visit the Division of Strategic Enrollment Management (http://www.sem.vcu.edu) website.

DIVISION OF STUDENT AFFAIRS

901 Floyd Avenue
Box 843017
Richmond, Virginia 23284-3017
Phone: (804) 828-1244
Fax: (804) 828-2180
students.vcu.edu (http://www.students.vcu.edu)

Charles Klink, Ph.D.
Senior vice provost for student affairs

The Division of Student Affairs comprises departments promoting the intellectual, cultural, personal, social, moral, financial, physical and psychological development of Virginia Commonwealth University students. The division provides administrative support for key policies of the university, including the VCU Honor System and the University Rules and Procedures. Visit the Division of Student Affairs (https://students.vcu.edu) online for updated information throughout the year.

Departments and offices

Student Accessibility and Educational Opportunity

This office welcomes and serves VCU students with documented disabilities who are registered for classes on the Monroe Park Campus. Visit the SAEO website (https://saeo.vcu.edu) for more information.

Office of Multicultural Student Affairs

The OMSA features cultural programs, discussion groups, student organizations, scholarship opportunities and much more in an effort to strengthen the university's sense of community through cultural appreciation. Visit the OMSA website (https://omsa.vcu.edu) for additional information.

Office of Student Conduct and Academic Integrity

This office supports the educational mission of the university by educating students about appropriate behavior and fostering a community supporting academic success. Visit their website (https://conduct.students.vcu.edu/) for more information.

Recreational Sports

Recreational Sports offers a range of programmed and informal recreational, fitness and sports activities for VCU students and faculty/staff/alumni/plus one members. Visit the RecSports website (https://recsports.vcu.edu) for more information.

Residential Life and Housing

This unit provides safe, inclusive and well-maintained facilities where intentional communities are built to empower residents in their academic excellence, citizenship and personal growth. See the Residential Life and Housing website (https://housing.vcu.edu) for more information.

Student Media Center

The Student Media Center (https://studentmedia.vcu.edu) is dedicated to the support and encouragement of responsible, independent student media to connect, explore and enrich the lives of the university's many constituencies.

Technology Support Services

Technology Support Services provide technical support and services to the Division of Student Affairs staff through the DSA help desk and VCU students through the Resnet help desk. Students can use their eID to sign in to the LANDESK (https://servicedesk.vcu.edu) for technology support.

University Counseling Services

UCS creates an environment that fosters student growth, development and psychological well-being through direct clinical service, education and prevention. Visit the UCS website (https://counseling.vcu.edu/) for more information.

University Student Health Services

USHS provides quality outpatient medical care and public health services, which also includes health education programming that empowers students to become full participants in their health care. Find more information on the USHS website (https://health.students.vcu.edu/).

University Student Commons and Activities

The facilities, services and programs of USCA bring together all members of the VCU community and contributes to intellectual, emotional and social growth through informal interaction. Visit the USCA website (https://usca.vcu.edu) for more information.

The Wellness Resource Center

The Well maximizes student success by fostering a healthy campus environment and is the public health outreach branch of University Student Health Services. Visit the Wellness Resource Center's website (https://thewell.vcu.edu) for additional information.

VCU Career Services

Career Services is committed to providing support to VCU students and recent alumni (one year or less) in the lifelong career development process. Visit the Career Services website (https://careers.vcu.edu) for more information about jobs and careers.

VCU LEAD

VCU LEAD (https://lead.vcu.edu/) is a living-learning program for undergraduate students of sophomore status or above, focused on developing graduates who can successfully lead professional and civic organizations within their respective fields.

Student government associations

The **VCU Student Government Association** is an elected body of students who are organized into three branches — executive, legislative and judicial — with various committees. Nonelected, at-large members are encouraged to join most of these committees. All meetings of the senate are open to the public. Visit the SGA website (https://sga.vcu.edu) for more information.

The **Graduate Student Association** serves as an advocate for graduate students at VCU. It sponsors events such as meet-and-greets, monthly socials and the annual Graduate Research Symposium (http://graduate.vcu.edu/research/symposium.html) that are designed to enhance academic skills, provide professional development opportunities and facilitate an active social environment. The GSA and the Graduate School work together to assist students with travel costs for academic conferences. The GSA places students on campuswide committees to ensure concerns of graduate students are heard. Visit the Graduate School website (http://www.graduate.vcu.edu/life/association.html) for more information.

University policies and procedures

A number of policies and regulations at VCU affect students, and many of these are printed in the general information chapters of this bulletin. Three policy documents are of particular interest to students.

- **VCU Rules and Procedures:** outlines the rights, responsibilities and privileges of each member of the university community and describes cases when disciplinary action, including separation from the university, may be taken against a member of this community as a result of prohibited behavior as outlined in this document
- **VCU Honor System:** defines academic dishonesty and provides a procedure for judging alleged violators of academic integrity
- **Grade Review Procedure:** outlines the process whereby students may appeal grades that they feel have been assigned unfairly

Each student is responsible for being familiar with the provisions of all university policies and regulations. The three policy documents described above are available in the VCU Policy Library (https://policy.vcu.edu), which is an excellent online resource.

GLOBAL EDUCATION OFFICE

912 West Grace Street
Box 843043
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Phone: (804) 828-8471
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global.vcu.edu (http://www.global.vcu.edu)

Jill Blondin, Ph.D.
Interim executive director

The Virginia Commonwealth University Global Education Office advances the university's three global priorities:

- Improve the recruitment and retention of international students and scholars
- Increase the global engagement of VCU students and faculty
- Expand VCU's global footprint through research, teaching and service — especially as they impact global health

The Global Education Office is home to five units and programs that advance the internationalization of the university.

Units and programs

Education Abroad

GEO's study abroad office offers student advising and placement in a full range of programs abroad, as well as academic unit support in developing, operating and evaluating study abroad programs.

English Language Program

The fully accredited intensive English program offers beginner to advanced levels of academic preparation. This large and growing program concentrates on academic preparation and study skills that equip students for success in their educational and career pursuits.

Global Outreach

The global outreach team supports the university's academic units in identifying and pursuing global priorities within the context of Quest for Distinction by facilitating international institutional agreements, coordinating the universitywide Global Advisory Network, supporting international faculty development and providing funding opportunities for global initiatives.

International Student and Scholar Programs

This program offers students, scholars and visitors a full suite of services that include academic and immigration advising, student engagement activities and campus and community orientation. The program equips faculty and staff with expertise and tools to support international students and scholars through workshops, faculty academies and individualized pedagogical consulting.

VCU Globe: A global education living-learning community

One of only 25 Peace Corps Prep programs in the nation and recognized by the 2015 Senator Paul Simon Award for Innovation in International Education, VCU Globe prepares undergraduates in all majors to live and work in a 21st-century global environment. In addition to completing in a rigorous, globally focused curriculum, students live together in the West Grace North residence hall and participate in community-engagement and leadership-building activities.

Education Abroad

Stephanie Tignor
Director

global.vcu.edu/abroad (http://global.vcu.edu/abroad)

VCU encourages students from every academic discipline to pursue part of their university education in an international setting by studying abroad. Education abroad benefits students academically, professionally and personally; students become more engaged in their academic field of study and often show stronger performance upon returning to campus from their study abroad experiences. Skills gained through education abroad help increase employment marketability upon graduation.

Students are encouraged to study in a foreign country for any length of time including summer, winter session, spring break, a semester or a full academic year as part of their degree program. The VCU Education Abroad office assists students in accomplishing these goals by providing information, advising and administering study abroad and exchange programs.

Participants must be in good standing with the university prior to participation. Please note that individual program requirements may vary.

Program offerings

VCU short-term study abroad

Each year VCU offers a variety of short-term program options during winter break, spring break or summer. Both faculty-led and direct-enroll options are available. Participants earn VCU or transfer credit and study subjects ranging from science, business and foreign language to arts, health care, economic development and beyond. New programs are created every year in countries as diverse as Barbados, Spain, Guatemala, Peru, Italy, Germany, Mexico, France and China.

International Student Exchange Program

International Student Exchange Program is a network of more than 300 colleges and universities in 50 countries that provides exchange opportunities for a summer, semester or academic year. ISEP is well-suited for mature, independent students who wish to be fully immersed into the host culture. Students usually enroll directly into their host university and take classes in the host language. A wide variety of options to study in English is also available. ISEP offers an affordable option to study abroad — charges are based on the cost of VCU in-state tuition, fees, and room and board in many of its locations.

Departmental and partnership exchanges

VCU has negotiated a number of direct student exchange agreements arising out of specific interest in the university community. Students pay their tuition and fees at VCU and enroll directly in the chosen host university. Options include a variety of destinations including Curtin University in Perth, Australia, University of Guadalajara, Mexico, University of the West of England in Bristol, UK, and the University of Córdoba, Spain.

Affiliate and alternative programs

Students seeking alternatives to VCU short-term programs, ISEP and exchanges may consider affiliate or alternative programs. Students may elect to participate in a program offered by another university or

organization. VCU Education Abroad will assist students in identifying and applying to the program, maintaining their VCU status while away, and securing financial aid where appropriate. All programs must be pre-approved by VCU.

Except for specific VCU short-term programs offered for VCU credit, all credit received through study abroad will appear on the students' transcripts as transfer credit. Students must earn the equivalent of a C, at minimum, for credit to be awarded. Grades are not calculated into the GPA, unless a student is attempting to graduate with honors.

English Language Program

Amber Bennett Hill, Ph.D.
Director

global.vcu.edu/elp (http://global.vcu.edu/elp)

The English Language Program offers an intensive university-preparation language program for nonnative speakers of English and serves international students, U.S. citizens, permanent residents and refugees. Core courses are offered at three levels of instruction — beginning through advanced — in multiple sessions each year. Core courses include reading and writing and speaking and listening.

Students may apply directly to the English Language Program. Admission to the ELP may also be recommended by VCU Undergraduate Admissions and International Admissions at the time of the application review. Placement in the ELP is based on the results of an English Language Placement Exam, taken upon arrival in Richmond.

More information

For more information, students may contact the English Language Program office at 912 W. Grace St., by phone at (804) 828-2551, by fax at (804) 828-2552 or by email at geo@vcu.edu.

Global Outreach

Osama Alami
Associate director, Global Education Office

global.vcu.edu/outreach (http://global.vcu.edu/outreach)

The global outreach team supports the university's academic units in identifying and pursuing global priorities within the context of Quest for Distinction by facilitating international institutional agreements, coordinating the universitywide Global Advisory Network, supporting international faculty development and providing funding opportunities for global initiatives.

International Student and Scholar Programs

Amber Bennett Hill, Ph.D.
Director

global.vcu.edu/students (http://www.global.vcu.edu/students)

International students face many challenges when entering a new country. GEO's International Student and Scholar Programs offers assistance and guidance as students adjust to a different culture and pursue their educational goals.

Program advisers help with pre- and post-arrival concerns, such as immigration, academic preparation and registration, airport pick-ups, housing, banking, health insurance, and other orientation activities.

Support continues throughout an international student's stay at VCU. The International Student and Scholar Programs staff assists, advises and refers students with academic, immigration, personal, legal, health and cultural issues. Advisers also confer with VCU faculty, staff and university officials regarding student concerns.

International Student and Scholar Programs offers educational, cultural and social activities that promote international understanding and community. Some activities include Global Cafes, Conversation Partners, Friendship Families, visits to places such as Washington, D.C. and New York City and other trips, including camping and skiing.

For information or assistance, please contact International Student and Scholar Programs, Global Education Office, 912 W. Grace St., at (804) 828-8471, by fax at (804) 828-2552 or by email at geo@vcu.edu.

OFFICE OF CONTINUING AND PROFESSIONAL EDUCATION

9 West Cary Street
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ocpe.vcu.edu (http://ocpe.vcu.edu)

Michael Huffman, Ph.D.
Director

The Office of Continuing and Professional Education (http://ocpe.vcu.edu) offers a wide range of services to VCU and to the community at large. The office, which is home to the Virginia Center for Consensus Building (http://ocpe.vcu.edu/who/vccb.html), combined the functions of two previous entities — the School of Education's Center for Professional Growth and the Division of Community Engagement's Office of Continuing Studies — to create a single, comprehensive hub for delivering and supporting quality learning experiences to individuals and organizations through continuing education and professional development.

Mission

OCPE, in partnership with the colleges and schools at VCU, provides and supports quality continuing and professional education, skills training and public policy mediation services for individual, local, regional and national impact. OCPE aligns its priorities to the appropriate themes of the strategic plan, Quest 2025: Together We Transform.

Goals

OCPE provides:

- Comprehensive logistical support for continuing education and professional development activities for the college and schools at VCU and VCU Health
- Educational opportunities that further personal, professional and organizational growth
- Customized solutions and mediation services to partners in the marketplace
- Lifelong learning opportunities for VCU alumni

Whether individuals want to enhance their career or find a new one, fulfill CEU requirements, develop customized training solutions for a company, arrange logistical support for an event, or find opportunities for personal enrichment, OCPE offers courses and services to achieve these goals.

For more information, visit the Office of Continuing and Professional Education website (http://ocpe.vcu.edu) or explore the course directory (http://ocpe.vcu.edu/courses).

GRADUATE COURSES

College of Engineering

Biomedical Engineering (EGRB)

EGRB 506. Artificial Organs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501 or permission of instructor. This course explores the design, operating principles and practices regarding artificial organs and their use in the human body. Analysis of dialysis systems for kidney replacement, artificial hearts and heart-assist devices, artificial heart valves, cardiac pacemakers, and sensory organ-assist and -replacement devices. Design aspects, legal ramifications, regulatory issues and clinical implantation issues will be addressed.

EGRB 507. Biomedical Electronics and Instrumentation. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Fundamental principles and applications of electronics and instrumentation as related to biomedical sciences.

EGRB 509. Microcomputer Technology in the Biomedical Sciences. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Microcomputer applications to the acquisition and manipulation of data in the biomedical laboratory.

EGRB 511. Fundamentals of Biomechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Calculus and ordinary differential equations (MATH 200-201, MATH 301 or equivalent). Presents basic mechanical properties of materials, describes methods of material testing and introduces techniques for analyzing the solid and fluid mechanics of the body. Considers topics such as stress/strain relationships, particle mechanics, and force balances.

EGRB 513. Cellular Signal Processing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In this course students will study the process by which an extracellular protein binding event is transduced and interpreted as an incoming signal into a cell. Students will learn the biology of cellular signal transduction, as well as how to apply computational models and experimental techniques to predict and investigate these pathways. The course will follow the course of a protein within a signal transduction cascade, from binding to a receptor, activating intracellular pathways, inducing new transcription and translation, and targeting of the protein to its final location. Students will develop MATLAB-based mathematical models to predict signal transduction dynamics and then study experimental techniques that are used to both disrupt and measure signal transduction.

EGRB 517. Cell Mechanics and Mechanobiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: previous course in biomechanics and a previous cell biology course, or permission of instructor. Graduate-level students will gain a quantitative understanding of cellular mechanics and the way cells detect, modify and respond to the physical properties within the cell environment. Students will gain a thorough understanding of relevant primary literature and mathematical models. Both experimental and theoretical approaches toward cell mechanics and mechanobiology will be addressed. Emphasis will be placed upon cells from the nervous, cardiovascular and pulmonary systems. Cancer cell mechanotransduction will also be addressed.

EGRB 591. Special Topics in Biomedical Engineering. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Enrollment is restricted to students with senior or graduate standing in the School of Engineering or by permission of the instructor. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of research training. See the Schedule of Classes for special topics to be offered each semester.

EGRB 601. Numerical Methods and Modeling in Biomedical Engineering. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Enrollment restricted to graduate students. The goal of this course is to develop an enhanced proficiency in the use of computational methods and modeling, to solve realistic numerical problems in advanced biomedical engineering courses and research, as well careers. The course will discuss and students will develop advanced technical skills in the context of numerical data analysis and modeling applications in biology and medicine. An important component of this course is developing problem-solving skills and an understanding of the strengths and weaknesses of different numerical approaches applied in biomedical engineering applications.

EGRB 602. Biomedical Engineering Systems Physiology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: EGRB 601. Enrollment restricted to graduate students. Biomedical engineering requires a foundational understanding of organ systems in the body as well as an advanced understanding of how to apply engineering principles and mathematical models to those systems. In this course, students will learn the basic physiology of major organ systems while also identifying and implementing mathematical modeling approaches to simulate and better understand these organ systems. Students will also learn how to apply engineering concepts, such as fluid dynamics, thermodynamics, structural mechanics and mass transport to better understand organ system physiology.

EGRB 603. Biomedical Signal Processing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Calculus and differential equations (MATH 301 or equivalent), including Laplace and Fourier Transforms. Explores theory and application of discrete-time signal processing techniques in biomedical data processing. Includes discrete-time signals and systems, the Discrete/Fast Fourier Transforms (DFT/FFT), digital filter design and implementation, and an introduction into processing of discrete-time random signals.

EGRB 604. Biomechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 201, MATH 301 or permission of instructor. Presents fundamental principles and conservation laws governing solid and fluid mechanics which are then applied to the mechanics of living systems. This enables an understanding of normal biomechanical function as compared with variations present in dysfunctional states. The objectives of this course are to introduce the student to the general mechanical function of a variety of biological materials and structures, linkage to structure-function relationships, and how these can be studied and represented mathematically.

EGRB 610. Microprocessor Interfacing for Biomedical Instrumentation. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: EGRB 509 or permission of instructor. Principles and applications of microprocessor interfacing for biomedical instrumentation. Topics include microprocessor architecture, assembly language, programming and debugging techniques, EPROM programming and bus structure and interfacing.

EGRB 611. Cardiovascular Dynamics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: PHIS 501 or PHIS 502. Analyzes and models the cardiovascular system in health and disease through studies on the properties of heart and vascular tissue, the mechanics of blood flow and the application of engineering methods to the diagnosis and treatment of cardiovascular pathologies.

EGRB 612. Structural Biomechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRB 511. Treats mechanical functions of the human body as an engineering structure used to assist and supplement these functions. Includes movement of the musculoskeletal system, joint reaction forces, stresses and strains developed within bones, function and design of orthopedic prostheses and braces, effect of vibration and impact on the body, mathematical and other models of the body.

EGRB 613. Biomaterials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Undergraduate material science or permission of the instructor. Primary and secondary factors determining the performance of materials used for implants in the human body. Topics will include metallurgy of stainless steel, cobalt-chromium alloys, titanium alloys, biocompatibility of implant materials, mechanical and physical properties of biomaterials, corrosion of biomaterials and medical polymers.

EGRB 615. Medical Imaging. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Calculus and college physics. Covers the physical principles and techniques of medical imaging modalities such as ultrasound, X-ray and nuclear magnetic resonance. Includes generation and detection of images, consideration of system design and qualitative image analysis.

EGRB 616. Cell Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501. This course will cover the cell and its engineering principles with an emphasis on current research techniques. Topics covered include the organization and structure of the cell, cell signaling, and application of cell biology to biomedical research. Advanced methods are taught enabling students to interpret and present findings from primary literature.

EGRB 618. Regenerative Engineering and Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: undergraduate or graduate level physiology or permission of instructor. Study of the design, development and clinical application of regenerative medicine strategies. Analysis of molecular and cellular engineering, biomaterials and tissue engineering, stem cell biology, and immunology as they pertain to pre-translational and clinically used regenerative medicine therapies, as well as the regulatory and ethical considerations of their implementation.

EGRB 619. Computational and Experimental Models of Cellular Signal Transduction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: EGRB 616 or permission of instructor. In this course students will study the process by which an extracellular protein binding event is transduced and interpreted as an incoming signal into a cell. Students will learn the biology of cellular signal transduction, as well as how to apply computational models and experimental techniques to predict and investigate these pathways. The course will follow the course of a protein within a signal transduction cascade, from binding to a receptor, activating intracellular pathways, inducing new transcription and translation, and targeting of the protein to its final location. Students will develop MATLAB-based mathematical models to predict signal transduction dynamics and then study experimental techniques that are used to both disrupt and measure signal transduction.

EGRB 635. Modeling for Biomedical Engineers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Permission of instructor. Applies mathematical modeling techniques to biomedical systems. Covers linear and nonlinear systems, deterministic and random systems, large systems, ecosystems, numerical techniques, graph theoretical approaches and simulation packages. Utilizes examples of biochemical, physiological and pharmacokinetic systems throughout.

EGRB 670. Advanced Molecular Modeling Theory and Practice. 3 Hours.
Semester course; lecture and laboratory hours. 3 credits. Prerequisite: MEDC 641, EGRB 641 or permission of the instructor. Examines the principles and applications of computational chemistry and molecular graphics to current problems in drug design. Lectures focus on the application of specific computational methods and techniques to solve problems in drug/molecular design. Workshop sessions provide hands-on experience using state-of-the-art hardware and software for molecular modeling.

EGRB 690. Biomedical Engineering Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of research reports and topics of current interest to the program seminar or special group seminar.

EGRB 691. Special Topics in Biomedical Engineering. 1-4 Hours.
Semester course; 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advance study, or specialized laboratory procedures not available in other courses or as part of the research training.

EGRB 697. Directed Research in Biomedical Engineering. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. degree or elective research projects for other students.

Chemical and Life Science Engineering (CLSE)

CLSE 543. Advanced Reaction Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the fundamental background needed to effectively design reactors at the macroscale exemplified by batch, pilot and plant operations or at the micro- and nano-scale exemplified by the current trend to miniaturize unit operations. A quantitative analysis is developed to explain why "real" reactor performance departs from ideal batch, CSTR and plug flow reactor performance.

CLSE 544. Applied Transport Phenomena. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the basis for analyzing mass, energy and momentum transport issues in environmental, chemical, biological and industrial processes. Molecular mechanisms of momentum transport, energy transport and mass diffusion are utilized to develop an engineering analysis of a given process. This molecular approach is complemented with macroscopic mass, momentum and mechanical energy balances.

CLSE 549. Process Biotechnology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide a rational basis addressing engineering challenges in the emerging biotechnology area. The course material is broad in scope covering biochemical synthesis, bioreactor design and bioprocess monitoring and control. It also deals with important issues associated with separation and purification techniques used with biomaterials.

CLSE 560. Protein Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or School of Pharmacy, or by permission of instructor. This course focuses on the structure-function characterization of proteins and the quantification of protein-protein interactions for the design of novel protein and peptide therapeutics. Additional topics include biochemistry of proteins for engineers, large scale, batch production and manufacturing techniques for biologics.

CLSE 561. Stem Cell Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 218 and CLSE 302. The production and behavior of adult and embryonic stem cells are studied and potential applications for the treatment of disease are surveyed. The importance of the extracellular matrix in cell differentiation and proliferation is established. Stem cell engineering techniques including parthenogenesis, nuclear transfer stem cells and embryonic carcinoma cells are introduced. The use of stem and germ cells for cloning, stem cells and tissue rejection, and ethical considerations in the use of embryonic human stem cells are discussed.

CLSE 562. Advanced Systems Biology Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 218, CLSE 115, and CLSE 302. The system-level properties of biology will be surveyed to understand how DNA leads to cellular behavior through complex molecular interactions. Theoretical and experimental concepts associated with high-throughput data (genomics, transcriptomics, metabolomics, fluxomics, proteomics), cellular regulation and computational modeling will be introduced. Bioinformatic analysis, integration of data and current challenges are discussed.

CLSE 563. Metabolic Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 218, CLSE 115, and CLSE 302. The principles and methods used in metabolic engineering of microbes will be covered. Theoretical and experimental concepts associated with metabolite production, strain design, strain construction and strain characterization will be introduced. Design principles, metabolic engineering challenges, metabolic engineering applications and ethical considerations of genomic alterations are discussed.

CLSE 570. Molecular Physiology and Microanatomy for Chemical and Life Science Engineering. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Prerequisites: BIOL 218 and CLSE 302. Understanding physiology from the molecular perspective of cellular biochemical mass action kinetics, molecular diffusion and transport, biomolecular separation processes, and dynamic biochemical control theory is key to the engineering and design strategies for medical intervention in disease and human health. This course explores these biomolecular dynamic events in human physiology with an emphasis on the application of the fundamental biochemical transport phenomena, kinetics and separation processes, and dynamic control theory. Laboratory component emphasizes living, single-cell manipulation and analysis methods, such as patch clamp devices, and the microanatomy of internal organs.

CLSE 575. Nanotechnology in Life Science and Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or Department of Chemistry, or with permission of instructor. Nanobiotechnology is the application of nano- and micro-fabrication methods to build tools for exploring the world of biological systems. This course will introduce the principles and practice of microfabrication techniques and perspectives in the field of nanobiotechnology. Lectures will cover interdisciplinary topics such as biomolecules at interfaces, biosensors, micro- and nano-fabrication strategies, self-assembly, nanoparticles, micro- and nano-devices and microfluidics.

CLSE 645. Biosensors and Bioelectronic Devices. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course develops the methodologies used in the design, fabrication and application of biosensors and bioelectronic devices to monitoring problems in the environmental, medical and chemicals industries. Fundamentals of measurement science will be applied to optical, electrochemical, mass and thermal means of signal transduction. Fundamentals of surface science will be used to interpret bio-immobilization, biofouling and non-specific interactions of enzymes, antibodies and DNA at surfaces.

CLSE 650. Quantitative Analysis in Chemical and Life Science Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 301. An understanding of the quantitative descriptions of chemical and biological processes is required for engineering analysis, including prediction and design. Analytical approaches are necessary to simplify and provide limits of complex behavior. These approaches include perturbation theory and scaling, density functional formulations, control theory, and stability theory. This course represents the applied mathematical foundations on equilibrium and nonequilibrium analysis of chemical and biological systems.

CLSE 654. Equilibrium Analysis in Chemical and Biological Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CLSE 305. Provides a molecular-based, thermodynamic framework for the quantitative equilibrium analysis of a broad range of biological and chemical processes. Contemporary equations of state, liquid solution models and elementary statistical mechanics are used to predict the behavior of molecules. Important issues addressed include the estimation of solvation and partitioning of molecules between phases or media, the calculation of free energy changes associated with cellular events and prediction of order/disorder phenomena.

CLSE 655. Nonequilibrium Analysis in Chemical and Life Science Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLSE 301, CLSE 302 and MATH 301. An understanding of the spatial and temporal dynamics of biological systems is key to many cellular events including cell signaling processes, second messenger systems, positive and negative feedback control, transcription, translation, and many more. This course introduces nonequilibrium (dynamic) analysis as applied to biological and chemical systems.

CLSE 656. Advanced Chemical Reaction Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 301 and CLSE 312. This course builds upon fundamental principles of chemical reaction engineering including integration of mass balances, reactor design equations and chemical rate laws. Emphasis is given to development of mathematical models and computational simulation of chemical reaction systems with multiple reactions. Additional topics include analysis of systems with unknown reaction parameters and mechanisms and bioprocess/biochemical approaches to chemical production.

CLSE 660. Biomolecular and Computational Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CLSE 650. Dynamic analysis of interacting cellular events, including cell signal pathways, clock reactions, etc., often requires large-scale computational approaches. Furthermore, these techniques are necessarily time dependent requiring unique methodologies, such as multi-time scale methods. This course introduces the subject of real-time biomolecular simulations.

CLSE 675. Polymers in Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is based on the need for integration of engineering and materials science of polymers with applications in life science engineering. Basic principles of polymer science including structural concepts at the molecular-, nano-, micro- and macro-scales are emphasized so that the student can understand structure/function correlation. The course treats polymer synthesis, molecular weight, morphology and surface science at an introductory level, but quantitative correlations are emphasized. Surface science is emphasized, as medical applications are often dependent on the interaction of a solid polymer with an in vivo environment (tissue, blood, membrane). The polymers chosen for emphasis include polyethylene (hip, knee replacement), poly(vinylchloride) (bood bags, catheters), polyurethanes (artificial heart, wound care) and silicones (implants, catheters). The use of polymers in drug delivery applications is explored, including osmotic-pressure-driven drug delivery. Concepts surrounding polymeric surface modifiers are developed, including applications such as enhanced biodurability and biocidal function.

CLSE 690. Research Seminar in Chemical and Life Science Engineering. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated up to eight times. Presentations and discussions of current problems and developments in life science engineering by faculty and visiting lecturers.

CLSE 691. Special Topics in Chemical and Life Science Engineering. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Prerequisites: At least one graduate-level engineering course and permission of the instructor. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other course offerings or as part of research training.

CLSE 692. Independent Study in Chemical and Life Science Engineering. 1-5 Hours.
Semester course; 1-3 lecture and/or 0-4 laboratory hours. 1-5 credits. Prerequisites: graduate standing or permission of instructor. The student must submit a prospectus to the graduate committee for approval and identify a faculty member willing to supervise the course. Investigation of specialized engineering problems through literature search, mathematical analysis, computer simulation and/or experimentation. Written and oral reports, final report and examination required.

CLSE 697. Directed Research in Chemical and Life Science Engineering. 1-9 Hours.
Semester course; variable hours. 1-9 credits. Prerequisite: graduate standing or permission of instructor. Research directed toward completion of the requirements for the M.S. or Ph.D. in engineering, with concentration in chemical and life science engineering, under the direction of an engineering faculty member and advisory committee. Graded S/U/F.

Computer and Information Systems Security (CISS)

CISS 609. Advanced Computational Intelligence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: an undergraduate course in artificial intelligence, or equivalent background with permission of instructor. Exploration of issues related to application of computational intelligence techniques to system security, particularly in the detection of anomalous system behavior. Of particular interest are issues associated with the automated detection of anomalies caused by authorized users through intended malicious behavior or through accidental misuse, and issues associated with automated user authentication. Crosslisted as: CMSC 609.

CISS 616. Data Warehousing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 610. Covers important concepts and techniques in the design and implementation of a data warehouse. Topics include the data warehouse architecture, the logical and physical design issues in the data warehousing development process, technical factors (i.e., hardware, client/server technology, data warehousing and DBMS technologies) and implementation considerations (i.e., data extraction, clean-up and transformation tools). Introduces online analytical processing and data mining. Crosslisted as: INFO 616.

CISS 618. Database and Application Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and practice of database and software security focusing in particular on some common database software security risks and on the identification of potential threats and vulnerabilities. Crosslisted as: CMSC 618.

CISS 622. Network and Operating Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CISS 624. Studies the principles of network security and secure operating systems. Included are topics relating to the use of intrusion detection, intrusion prevention and other related tools. Crosslisted as: CMSC 622.

CISS 624. Applied Cryptography. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a comprehensive survey of modern cryptography. Included are techniques of enciphering and deciphering messages using cryptographic algorithms, block ciphers and block cipher modes, hash functions and message authentication codes, public key cryptography and digital signatures, and steganography. Crosslisted as: CMSC 620.

CISS 634. Ethical, Social and Legal Issues in Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyzing socio-political and ethical issues surrounding computer and information systems security. Topics include privacy laws, identity theft, information collection and retention policies, and enforcement.

CISS 644. Principles of Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or INFO 661. Explores issues related to protecting information resources of a firm. Various tools and techniques useful for assessing CISS security concerns in organizations are introduced. Principles and models for CISS security and security management are presented and selected computer and CISS security topics are introduced. Material is presented and discussed from a management frame of reference. Crosslisted as: INFO 644.

CISS 646. Computer and Information Systems Access Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Detailed discussion of access control, including administration, identification and authentication techniques, methodologies and implementations, methods of attack, monitoring, and penetration testing.

CISS 654. Business Continuity and Disaster Recovery Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Fundamentals of business continuity and disaster recovery planning. Includes risk assessment, physical facility protection, data recovery planning, strategies for network backup, desktop recovery, emergency decision making, and maintenance and testing of the plan and its components.

CISS 693. Practice of Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will undertake practical research projects. Written reports of the investigations are required. This course is intended to be taken at the end of the program.

CISS 697. Guided Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Intended for graduate students in the Computer and Information Systems Security program wishing to do research on problems in computer and information systems security. Approval of proposed work is required by the director of graduate programs of the Department of Information Systems or of the Department of Computer Science no later than the 10th week of the prior semester. Each student will work with an appropriate faculty member on an approved research proposal. The student will submit a written report on the research conducted as the final product for the course. This course is intended to be taken near the end of the student's degree program.

Computer Science (CMSC)

CMSC 501. Advanced Algorithms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CMSC 401 or equivalent; graduate standing or acceptance into acclerated B.S. to M.S. program in computer science. Advanced graph algorithms, advanced data structures, applied numerical algorithms, optimization methods, approximation methods for hard graph and string problems, and computational geometry algorithms.

CMSC 502. Parallel Algorithms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CMSC 312 and CMSC 401, graduate student standing or acceptance into the five-year accelerated B.S. and M.S. program in computer science. Software and hardware mechanisms for providing mutual exclusion in uniprocessor and multiprocessor environments. Architectural issues including pipeline design, superscalar computers, multiprocessors, memory systems, peripherals, interfacing techniques, networks, performance and software issues. Design and uses of parallel algorithms to solve concurrency problems in a distributed environment including message passing and remote procedure calls. Students will work in teams (as well as on individual projects) to design and implement parallel algorithms.

CMSC 506. Computer Networks and Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 312. Theoretical and applied analysis of basic data communication systems; design of networks in the framework of the OSI reference model; Local and Wide Area Networks; performance analysis of networks; error control and security. Students will work in teams to design and implement a small computer network. Crosslisted as: EGRE 526.

CMSC 508. Database Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 401. Design and implementation of relational database systems. Emphasis is placed on entity-relationship diagrams, relational algebra, normal forms and normalization. Introduction to SQL. Discussion of physical level issues. Students will be required to complete a design project and give an oral presentation of the project. Not applicable toward M.S. in Computer Science or the Ph.D. in Engineering, computer science track.

CMSC 510. Regularization Methods for Machine Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in computer science or related discipline such as bioinformatics or acceptance into five-year accelerated program in computer science. The course will assume undergraduate-level background in algorithms, linear algebra, calculus, statistics and probability. Upon successful completion of this course, the student will be able to understand recent advances in machine learning and apply machine-learning tools that go beyond learning from data, as well as have the ability to incorporate additional knowledge about the learning problem. Topics covered will include optimization-based view of supervised machine learning; classical regularization approaches including weight decay and Lasso; regularization terms incorporating additional knowledge about structures in the feature space, including group lasso and graph-based regularization terms; semi-supervised learning using graphs linking unlabeled and labeled samples.

CMSC 512. Advanced Social Network Analysis and Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: CMSC 412 and CMSC 501. Enrollment requires graduate student standing in computer science or related discipline such as bioinformatics, or acceptance into five-year accelerated program in computer science. The purpose of the course is to teach algorithms for analyzing social networks and complex systems. The focus will be on understanding the inner workings of algorithms using in-network analysis and security threats in online social network sites. Topic covered will include modeling social and technological networks, methods for analyzing structure and dynamical processes on the network, and security and privacy issues in online social networks such as inference attacks, network anonymization, sybil attacks and defense, social bots.

CMSC 516. Advanced Natural Language Processing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to graduate students in computer science or related discipline, or acceptance into five-year accelerated program in computer science. Upon successful completion of this course, the student will be able to understand recent advances in natural language processing and apply NLP algorithms and techniques for processing unstructured text. Word-level, syntactic and semantic processing will be considered. Specific topics include rule-based and statistical methods for creating computer programs that analyze, generate and understand human language. Regular expressions and automata, context-free grammars, probabilistic classifiers and machine learning. Applications to real-world problems such as spell-checking, Web search, automatic question answering, authorship identification and developing conversational interfaces.

CMSC 525. Introduction to Software Analysis, Testing and Verification. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CMSC 401 and 403, graduate student standing or acceptance into the five-year accelerated B.S. and M.S. program in computer science. An introduction to concepts and techniques used in the analysis of software for certain properties. Using analytic results to derive test data and verify the correct implementation of programs. Flow graphs, fault/failure model, theoretical and practical limitations. Control flow, data flow and error flow analyses. Testing strategies including random, structural, mutation and error flow. Software metrics.

CMSC 526. Theory of Programming Languages. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 403, graduate student standing or acceptance into the five-year accelerated B.S. and M.S. program in computer science. An introduction to the formal semantics of programming languages, logic programming and functional programming. Topics include denotational semantics, attribute grammars, Backus Formal Functional Programming, fixed point semantics, model-theoretic semantics and PROLOG.

CMSC 591. Topics in Computer Science. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisites may vary. Permission of the instructor required. Course is open to graduate students and students accepted into the five-year accelerated B.S. and M.S. program in computer science. A study of selected topic(s) in computer science at the graduate level. See the Schedule of Classes for specific topics to be offered each semester.

CMSC 601. Convex Optimization. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 501 or permission of instructor. Enrollment restricted to students with graduate standing in computer science or related discipline. A background in undergraduate-level linear algebra is assumed. Convex sets and functions. Convex optimization problems: Linear, quadratic, semi-definite and cone programs. Duality theory. Approximation algorithms for NP-complete integer optimization problems via semi-definite relaxations and rounding schemes. Algorithms for optimization, such as gradient descent, proximal descent, alternating directions method of multipliers, interior point methods.

CMSC 602. Operating Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 502. A study of operating systems including those in multiprocessor and distributed environments. I/O programming, resource management (including processor and memory management), security and system performance evaluation.

CMSC 603. High Performance Distributed Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in computer science or related discipline or acceptance into five-year accelerated program in computer science. The course will assume undergraduate-level background in algorithms, data structures and parallel programming. Upon successful completion of this course, the student will be able to understand the concepts underlying distributed systems; analyze problems to identify performance bottlenecks, parallelization opportunities and concurrency issues in a distributed environment; create distributed and scalable implementations using multiple hosts/GPUs; design and implement algorithms using Hadoop, Spark and CUDA.

CMSC 605. Advanced Computer Architecture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 426 or with permission of instructor. This course will focus on the design and analysis of high performance computer architectures. Topics investigated include pipeline design, superscalar computers, multiprocessors, memory systems, peripherals, interfacing techniques, networks, performance and software issues. Crosslisted as: EGRE 635.

CMSC 608. Advanced Database. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 508. Topics discussed include: handling of missing information; the relationship between relational calculus, relational algebra and SQL; logic databases; distributed databases; outer joins; and transaction processing. Emphasis is placed on theoretical issues involved in these topics. In addition students will work in teams to develop a working database application.

CMSC 609. Advanced Computational Intelligence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: an undergraduate course in artificial intelligence, or equivalent background with permission of instructor. Exploration of issues related to application of computational intelligence techniques to system security, particularly in the detection of anomalous system behavior. Of particular interest are issues associated with the automated detection of anomalies caused by authorized users through intended malicious behavior or through accidental misuse, and issues associated with automated user authentication. Crosslisted as: CISS 609.

CMSC 610. Algorithmic Foundations of Bioinformatics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Graduate student standing or acceptance into five-year accelerated program in computer science or related discipline such as bioinformatics. The purpose of the course is to teach algorithms for analyzing biological and medical data. The focus will be on understanding the inner workings of algorithms used in bioinformatics tools. Topic covered will include algorithms for assembling and searching biological sequences, finding patterns associated with disease, and exploring biological networks.

CMSC 611. Computer Multimedia. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Study of computer multimedia techniques relating to images, sound, video and text. Emphasis on compression techniques and standard storage formats. This course is programming-intensive.

CMSC 612. Game Theory and Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 401, graduate student standing or acceptance into the five-year accelerated B.S. and M.S. program in computer science. The course will provide an introduction to game theory and mechanism design concepts. Lectures cover topics such as introduction of games, equilibrium concepts, computation of game-theoretic solution concepts, mechanism, and issues in game theory and mechanism design.

CMSC 615. Cryptocurrency and Blockchain Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with graduate standing in computer science or a related discipline. The course will assume undergraduate-level background in algorithms, data structures and programming. Upon successful completion of this course, the student will be able to understand the major concepts about cryptocurrency and blockchain techniques; be familiar with major blockchain applications as well as real-world issues; understand the underlying consensus mechanisms in the Bitcoin system and other alternative cryptocurrency systems; analyze the security of Nakamoto consensus; understand, write and execute smart contracts using an Ethereum-like platform.

CMSC 618. Database and Application Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and practice of database and software security focusing in particular on some common database software security risks and on the identification of potential threats and vulnerabilities. Crosslisted as: CISS 618.

CMSC 619. The Design and Specifications of User Interfaces. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Graduate standing and permission of instructor. Requires knowledge of first order predicate calculus and context-free languages. Focuses on human-computer interface design principles and methodology and formal specifications of user interfaces.

CMSC 620. Applied Cryptography. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a comprehensive survey of modern cryptography. Included are techniques of enciphering and deciphering messages using cryptographic algorithms, block ciphers and block cipher modes, hash functions and message authentication codes, public key cryptography and digital signatures, and steganography. Crosslisted as: CISS 624.

CMSC 621. Theory of Computation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate student standing and permission of instructor. Discussion of the complexity and computability of problems and programs. Topics will include unsolvability, universal programs and abstract complexity.

CMSC 622. Network and Operating Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CISS 624. Studies the principles of network security and secure operating systems. Included are topics relating to the use of intrusion detection, intrusion prevention and other related tools. Crosslisted as: CISS 622.

CMSC 623. Cloud Computing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 622. Provides an introduction to cloud computing architecture and cloud computing security. The course covers the basic concepts of cloud computing, including memory virtualization, device virtualization and related security problems in cloud computing.

CMSC 624. Software Quality Assurance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: a course in software engineering and graduate standing in computer science, or permission of instructor. A study of issues that affect the quality of software and of methodology to assure that software products are of the desired quality. This also includes issues in assessing product quality as well as the process by which the software is produced. Topics include various methodologies, standards, metrics and tools.

CMSC 625. Advanced Software Analysis, Testing and Verification. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 525. Studies the concepts and techniques used in the analysis of software and the derivation of test data. Focuses on software metrics and reliability; construction of tools to aid software analysis and testing. Requires students to review seminal and current papers from the literature, and lead their discussion in class.

CMSC 628. Mobile Networks: Applications, Modeling and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with graduate standing in computer science or related discipline. The course will assume undergraduate-level background in algorithms, data structures, programming and networks. Upon successful completion of this course, the student will be able to understand the major concepts about mobile networks such as device-to-device communication technologies, mobility models and coverage; be familiar with various mobile network types (e.g., mobile social networks, delay tolerant networks, overlay networks, vehicular networks and cellular networks) and devices (e.g., smartphones, femtocells, WiFi), learn how to model mobile networks with stochastic processes and real datasets; be able to use different networking simulators; and understand various routing algorithms and analyze their behavior.

CMSC 630. Image Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in engineering or science or by permission of instructor. Introduces theoretical and practical aspects of computer vision for image processing and understanding. It provides a comprehensive walkthrough from basics of image preparation to using computational intelligence tools for knowledge discovery from images. The course will cover basics of image processing and computer vision, including image sampling and quantization, color, pixel-based operations, image filtering, morphological image processing, and image transforms; information extraction including segmentation and feature extraction; pattern recognition for computer vision: classification, novelty and object detection, image understanding, learning from video streams, and tensor-based methods. Examples will include medical image analysis, object recognition in ground and aerial photographs and hyperspectral imaging.

CMSC 635. Knowledge Discovery and Data Mining. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 401 or corequisite: CMSC 501. Enrollment restricted to students with graduate standing in computer science or related discipline such as bioinformatics or acceptance into five-year accelerated program in computer science. Covers knowledge discovery and data mining concepts, tools and methods; provides hands-on experience based on a project involving analysis of large real-life data. Topics include the knowledge discovery process, data storage and representation, preprocessing algorithms for missing data imputation, feature selection and discretization; unsupervised learning algorithms for clustering and association mining; supervised learning algorithms including decision trees, Bayesian models and introduction to support vector machines and neural networks; ensemble learning; protocols and measures for validation of predictive models; and data security and privacy issues.

CMSC 636. Artificial Neural Networks and Deep Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in computer science. The course will assume undergraduate-level background in programming, algorithms, linear algebra, calculus, statistics and probability. Topics ranging from fundamental learning rules, functional, cascade correlational, recurrent and gradient descent networks, to neocognitron, softmax, deep convolutional networks, autoencoders and pretrained deep learning (restricted Boltzmann machines). Students will be required to work in teams on a class paper.

CMSC 678. Statistical Learning and Fuzzy Logic Algorithms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH/STAT 309 or 310. The course considers two central problems in modern science and engineering: i) the problem of statistical learning from examples (empirical data) and ii) the problem of embedding existing human knowledge into workable mathematics. Topics include: examples of multivariate functional mapping, basics of classic classification and regression, support vector machines as a learning paradigm based on structural risk minimization, fuzzy logic algorithms, basics of multi-class classification over high dimensional spaces, curve and surface fittings, multivariate function approximation and nonlinear optimization; fuzzy logic systems; crisp and fuzzy sets, linguistic variables, fuzzy set theory; if-then rules, fuzzy interference, fuzzification and defuzzification, neuro-fuzzy paradigms.

CMSC 691. Special Topics in Computer Science. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisites: at least one graduate-level computer science course pertaining to the topic area and permission of instructor. An advanced study of selected topic(s) in computer science at the graduate level. See the Schedule of Classes for specific topics to be offered each semester.

CMSC 692. Independent Study. 1-3 Hours.
Semester course; 1-3 variable hours (to be arranged). 1-3 credits. Enrollment restricted to students with graduate standing and consent of instructor. Independent study done under the supervision of a faculty member. The student must identify a faculty member willing to supervise the research and submit a proposal for approval by the computer science graduate committee no later than the 10th week of the prior semester. A written report and an oral presentation are required upon completion of the research project. Graded as Pass/Fail.

CMSC 697. Directed Research. 1-15 Hours.
Semester course; variable hours (to be arranged). 1-15 credits. May be repeated for credit. A total of 3 credits may be used to fulfill the M.S. in Computer Science thesis requirement. Prerequisite: graduate standing. Independent research culminating in the writing of the required thesis or dissertation. The student must identify a faculty member willing to supervise the research and submit a proposal to the computer science graduate committee no later than the 10th week of the prior semester. This proposal must be approved before the student can register for the course. Graded as S/U/F.

CMSC 701. Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Ph.D. standing or permission of instructor. Covers the principles of conducting a research project, reporting the findings in the form of a journal paper and promoting the research through public presentations. Students learn to write grant proposals and practice reviewing research papers and grant proposals. The main emphasis of the course is writing a paper and a grant proposal in a format compliant with NSF, NIH or DoD guidelines.

CMSC 702. Computer Science Seminar. 1 Hour.
Semester course; 1 seminar hour. 1 credit. May be repeated for credit. Enrollment restricted to students in the doctoral program in computer science. Students will attend a weekly research seminar in which the topic and speaker will change each week in order to cover a broad range of subjects at the forefront of computer science research. Students will have to present and to write a report on at least one seminar presented by other speakers. The objective is to expose students to research topics and scholars in the field of computer science as well as to provide them experience in delivering and critiquing seminar talks. Graded as satisfactory/unsatisfactory.

Electrical and Computer Engineering (EGRE)

EGRE 521. Advanced Semiconductor Devices. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 303, PHYS 420 and 440, or equivalents or permission of instructor. Studies the fundamentals of semiconductor heterojunctions, metal-semiconductor contacts, metal-oxide-semiconductor structures, defects, interface states, scaled MOS transistors and heterojunction bipolar transistors.

EGRE 525. Fundamentals of Photonics Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 303, 309 and 310 or equivalents. An introduction to the interaction of electromagnetic lightwaves with solid-state materials. Based on the quantum mechanics of photon emission and absorption, the generation and detection of coherent light by semiconductor lasers and photodetectors are investigated. Optical waveguides also are studies for use in sensors employing interferometric and evanescent-field principles. Examples of integrated photonic sensors are presented for mechanical, chemical and biological systems.

EGRE 526. Computer Networks and Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CMSC 312. Theoretical and applied analysis of basic data communication systems; design of networks in the framework of the OSI reference model; Local and Wide Area Networks; performance analysis of networks; error control and security. Students will work in teams to design and implement a small computer network. Crosslisted as: CMSC 506.

EGRE 531. Multicore and Multithreaded Programming. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 364 or CMSC 311 or permission of instructor. Introducing multicore architectures, multithreaded programming models, OpenMP, Pthreads, thread synchronization, performance evaluation and optimization, load balancing and software tools for multicore/multithread programming.

EGRE 532. GPU Computing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CMSC 502, EGRE 531 or permission of instructor. The primary objective of this course is to provide students with knowledge and hands-on experience in developing application software for graphics processing units. The course concentrates on parallel programming basics, GPU hardware architecture and software, GPU programming techniques, GPU performance analysis and optimization, and application development for GPUs.

EGRE 535. Digital Signal Processing. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Prerequisites: EGRE 337 or consent of instructor. The course focuses on digital signal processing theory and algorithms, including sampling theorems, transform analysis and filter design techniques. Discrete-time signals and systems, and filter design techniques are treated. Several applications of DSP in telecommunications, image and video processing, and speech and audio processing are studied.

EGRE 540. RF Communications and Antennas. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 309 or equivalent or permission of instructor. Basics of electromagnetics and passive RF components such as filters, isolators, tuners, phase shifters, resonators and tees are discussed, along with design and characterization of wire and planar antennas.

EGRE 541. Medical Devices. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. An introduction to engineering applications in medicine and design principles for next-generation medical devices. Topics include early cancer detection using microwaves, wireless data telemetry using implantable or body-centric systems, implantable sensors, biodegradable sensors, hyperthermia/ablation for cancer treatment, magnetic resonance imaging, and deep brain and nerve stimulation.

EGRE 553. Industrial Automation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 246 and EGRE 254, or permission of the instructor. Enrollment restricted to students with senior or graduate standing in the School of Engineering. This course provides an introduction to the systems, techniques and languages used in the control of manufacturing and process industries. Major topics include programmable logic controller operation and programming, supervisory control and data acquisition systems, and human machine interfaces. Other topics include an introduction to feedback control systems, analog-to-digital and digital-to-analog conversion, sensors and transducers, and actuators and motors.

EGRE 554. Advanced Industrial Automation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 553. This course provides additional instruction on topics related to systems, techniques and languages used in the control of manufacturing and process industries. Major topics include advanced PLC programming and operation, motion control, and HMI programming. Other topics include feedback control systems, industrial networking and system simulation.

EGRE 555. Dynamics and Multivariable Control I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 301 and 310 or the equivalent. Systems of differential equations with controls, linear control systems, controllability, observability, introduction to feedback control and stabilization. Crosslisted as: MATH 555.

EGRE 573. Sustainable and Efficient Power Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 309 or EGRE 471 or permission of instructor. The course covers distributed power generation system and renewable energy technologies. It introduces models and tools for investigating electric power generation and efficiency analysis, the wind and solar power, energy storage, renewable integration, and environmental impacts. At the completion of the course students will be able to apply appropriate models and complete a feasibility study of practical renewable energy systems.

EGRE 591. Special Topics in Electrical and Computer Engineering. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Prerequisite: senior or graduate standing in the School of Engineering or permission of the instructor. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of research training.

EGRE 620. Electron Theory of Solids. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 420 and 440 or permission of instructor. The study of electronic structures, band structure calculations, optical absorption and emission, lasing in semiconductors, electron-photon interactions, heterostructures and nanostructures. Quantum theory of electron-photon interaction, absorption and emission, semiconductor lasers, linear response transport, Landauer Buttiker formulas, mesoscopic devices and phenomena, resonant tunneling, single electronics, non-equilibrium Green's function formalism, second quantization, coupled mode theory, electrons in a magnetic field, and integer quantum Hall effect.

EGRE 621. Spintronics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 620 or equivalent, or with permission of instructor. Basic concept of spin, spin interactions, spin transport, spin-based classical devices, single spintronics and spin-based quantum computing.

EGRE 622. MEMS Design and Fabrication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 303 and EGRE 334 or permission of instructor. The course provides the background required to conduct research in microelectromechanical systems. The course provides an overview as well as detailed coverage of material properties, specialized fabrication techniques and the fundamental principles of the major classes of MEMS devices. This will include mechanical sensors and actuators, surface acoustic wave devices, optical sensors, modulators and switches, bioMEMS, chemical and biochemical sensors, and microfluidic devices.

EGRE 624. Nonlinear Optical Materials and Devices. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 525 or equivalent or permission of instructor. This course describes the principles of nonlinear optics and discusses the operation of photonic devices and systems that utilize various second- and third-order nonlinear optical effects. The topics include electromagnetic wave propagation in anisotropic media, nonlinear optical susceptibility tensor, linear and quadratic electro-optic effects, second harmonic, sum- and difference-frequency generation, phase-matching, parametric amplification, optical switching, multi-photon absorption, and self-focusing and self-phase modulation.

EGRE 625. Clean Room Lab Practicum. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Prerequisite: EGRE 334 or permission of instructor. The course develops the detailed knowledge and skills required to design and fabricate advanced microscale and nanoscale devices for doctoral thesis work in a micro- and nano-fabrication facility cleanrooms. The course focuses on fabricating a nanostructured device and involves photolithography, wet and dry etching, oxidations, diffusions and thin film depositions. Students will complete the processing of the device and perform characterization experiments. Design skills will also be developed, including design and layout using software tools and fabrication of custom photomasks. Students will document all aspects of the laboratory work.

EGRE 626. Advanced Characterization of Electronic Materials and Devices. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 303 or permission of instructor. This course discusses crystal symmetry in relation with physical properties of crystalline solids, with special emphasis on semiconductor materials forming the basis of modern electronic and optoelectronic devices, point and extended defects and their effects on electronic and optical properties of semiconductor materials and device performance, and defect formation during processing. The course also covers in depth structural, electrical and optical techniques used to reveal various structural defects: the theory and practice of X-ray, neutron and electron diffraction methods, transmission and scanning electron microscopy, scanning probe microscopy, Hall effect, deep-level transient spectroscopy, photo- and cathodoluminescence, and time-resolved spectroscopy, with particular focus on their applications to real semiconductor materials and device structures.

EGRE 627. Nanophotonics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 525 or equivalent or permission of instructor. Advances in nanotechnology and fabrication have allowed scientists to control light like never before, bringing topics of science fiction such as cloaking, unlimited resolution imaging, nanometer-thick optics and breakthrough treatments for disease into the realm of reality. This course explores what is possible when students can confine light at the nanoscale and engineer materials at will, covering topics such as light guiding by metals (plasmonics), optical lattices (photonic crystals), arbitrary materials (meta-materials/surfaces), nanoscale lasers (spasers) and stopping light (static optics). Students are exposed to the newest advances in the field through discussion, projects and presentations.

EGRE 631. Real-time and Embedded Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 426 or equivalent or permission of instructor. Presents advanced material in the area of the design, implementation and testing of embedded computer systems intended to operate as part of a larger system. Topics to be discussed include design challenges of embedded computing, real-time scheduling theory, worst-case execution time analysis, embedded architectures, embedded software design and performance optimizations. Hands-on labs and a research project on advanced topics in this field will be included in this course.

EGRE 632. Dependable Embedded Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 364 or permission of instructor. This course explores the rich set of issues that must be considered when dealing with dependable embedded systems in smart energy delivery, transportation, interconnected health and medical devices and smart buildings, which have one or more of the following attributes: need for safety, continuous reliable operation, resilient to disruptions, secure against cyber-attacks, operate in real-time, maintainable and designed correctly. Among the topics covered are fault-tolerant computing, reliability and safety engineering, understanding the origins of failures and errors, design criteria, software reliability, formal verification of designs, cyber security, review of standards in safety critical systems and social/legal concerns.

EGRE 635. Advanced Computer Architecture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 426 or with permission of instructor. This course will focus on the design and analysis of high performance computer architectures. Topics investigated include pipeline design, superscalar computers, multiprocessors, memory systems, peripherals, interfacing techniques, networks, performance and software issues. Crosslisted as: CMSC 605.

EGRE 636. Introduction to Cyber-Physical Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRE 335 and EGRE 365 or equivalents or permission of instructor. This course introduces students to the research, design and analysis of cyber-physical systems -- the tight integration of computing, control and communication. The main focus is on understanding existing and emerging models of CPSs, as well as physical processes in terms of differential equations and computational models for discrete time systems, such as extended finite-state machines and hybrid automata. State-charts are introduced and combined with the physical models for analysis of embedded systems. Linear temporal logic is introduced and applied to specify the desired system behavior. Tools for analytical study and verification of the satisfaction of linear temporal logic formulae are presented and discussed in numerous applications. Dependability attributes such as safety, reliability and cyber-security are discussed in the context of high integrity CPSs.

EGRE 640. Semiconductor Optoelectronics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 309 or equivalent or permission of instructor. Discussions of optical processes in semiconductors and semiconductor heterostructures in terms of radiative and nonradiative processes, as well as absorption. Also covers in depth the theory and practice of light-emitting diodes, including those intended for solid-state lighting, lasers and detectors.

EGRE 644. Wireless Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 444 or permission of instructor. The main objective of this course is to introduce the fundamental principles of wireless communications. The focus will be on the physical layer and wireless transceiver design issues. Students are expected to gain a thorough understanding of wireless channel modeling, the concept of channel fading, the means to mitigate the effect of fading through diversity techniques. Some practical wireless communication techniques will also be introduced such as space-time coding, multiple input multiple output communications and orthogonal frequency-division multiplexing.

EGRE 651. Intelligent Linear Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 337 or permission of instructor. This course covers selected topics on intelligent systems and fundamental principles of system analysis. Emphasis is placed on the student gaining mathematical modeling experience, performing computer simulations and designing systems architecture. Topics include intelligent agents, autonomous control, linear algebraic equations for state variable equations, complex dynamic systems, controllability and observability, linear discriminant functions in algorithm-independent optimization, multilayer neural networks, unsupervised learning and clustering, mobile robot localization and kinematics, and perception for planning and navigation.

EGRE 656. Estimation and Optimal Filtering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 310, EGRE 337 and EGRE 555/MATH 555. This course will expose students to the fundamental issues in parameter estimation and recursive state estimation for dynamic systems. Topics covered will include maximum likelihood estimation, maximum a posteriori estimation, least squares estimation, minimum mean square error estimation, Cramer-Rao lower bound, discrete-time Kalman filter for linear dynamic systems, extended Kalman filter for nonlinear problems and system models for the Kalman filter.

EGRE 671. Power System Operations and Controls. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGRE 471 or equivalent. This course covers the fundamental concepts of economic operation and controls of power systems, including real and reactive power balance, optimized generation dispatch, steady state and dynamic analysis, real-time monitoring and controls, and contingency analysis. Upon completion of this course, students will be able to develop equivalent circuits and compute programs for power flow analysis, define and analyze automatic generation control scheme on a power system, develop generation dispatching schemes, define and analyze state estimation of a power system using analysis programs, and perform contingency studies of the grid.

EGRE 691. Special Topics in Electrical and Computer Engineering. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Prerequisites: at least one graduate-level engineering course and permission of instructor. An advanced study of selected topic(s) in electrical and computer engineering. See the Schedule of Classes for specific topics to be offered each semester.

EGRE 692. Independent Study. 1-3 Hours.
Semester course; 1-3 lecture and 1-3 laboratory hours. 1-3 credits. Prerequisites: graduate standing and permission of instructor. The student must identify an electrical and computer engineering faculty member willing to supervise the course and submit a proposal for approval to the electrical and computer engineering graduate committee. Investigation of specialized electrical and computer engineering problems through literature search, mathematical analysis, computer simulations and/or experimentation. Written and oral reports, final report and examination are required.

EGRE 697. Directed Research in Electrical and Computer Engineering. 1-15 Hours.
Semester course; variable hours. 1-15 credits. Prerequisite: graduate standing or permission of instructor. Research directed toward completion of the requirements for the electrical and computer engineering track in the M.S. or Ph.D. in Engineering performed under the direction of an electrical and computer engineering faculty member and advisory committee. Graded as S/U/F.

Engineering (ENGR)

ENGR 591. Special Topics in Engineering. 1-4 Hours.
Semester course; 1-4 credits. Prerequisite: senior or graduate standing in the School of Engineering, or permission of the instructor. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of research training.

ENGR 690. Engineering Research Seminar. 1 Hour.
Semester course; 1 credit. May be repeated for a maximum of 2 credits. Presentations and discussion of current problems and developments in engineering by students, staff and visiting lecturers.

ENGR 691. Special Topics in Engineering. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. An advanced study of selected topic(s) in engineering. See the Schedule of Classes for specific topics to be offered each semester.

ENGR 692. Independent Study. 1-3 Hours.
Semester course; 1-3 lecture and 1-3 laboratory hours. 1-3 credits. Prerequisites: graduate standing and consent of instructor. The student must identify a faculty member willing to supervise the course and submit a proposal for approval to the appropriate track's graduate committee. Investigation of specialized engineering problems through literature search, mathematical analysis, computer simulation and/or experimentation. Written and oral reports, final report and examination are required.

ENGR 697. Directed Research. 1-15 Hours.
Semester course; variable hours. 1-15 credits. Research directed toward completion of the requirements for M.S. and Ph.D. in Engineering degrees under the direction of engineering faculty and an advisory committee. Graded S/U/F.

Mechanical and Nuclear Engineering (EGMN)

EGMN 501. Advanced Manufacturing Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGMN 425 and EGMN 426, graduate standing in the School of Engineering, or permission of instructor. Studies the fundamental systems required for mechanical, chemical and electrical manufacturing, including material procurement, logistics, quality and distribution. The principles are applied to all types of manufacturing processes from project through continuous. Advanced systems for lean, agile and global manufacturing also are covered.

EGMN 502. Product Design and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: senior or graduate standing in the School of Engineering, or permission of instructor. Presents engineering concepts and techniques necessary to successfully develop new products and introduce them to the marketplace. Topics include development processes, converting direct customer input to marketing specifications, creating technical specifications, quantifying customer input, using rapid prototyping to reduce development time, design for manufacturability and product certification issues.

EGMN 505. Characterization of Materials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: senior or graduate standing in the School of Engineering, or permission of instructor. Focuses on characterization techniques of solids at the molecular, surface and bulk levels, including resonant, vibrational and electronic spectroscopies, X-ray methods and optical and electron microscopies. A connection will be developed between the theoretically-derived and experimentally-observed properties of materials and a rationale also will be developed for choosing an appropriate characterization technique for a given material.

EGMN 506. Industrial Hygiene. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. The course will acquaint students with methods used by industrial hygienists to identify, evaluate and control human exposure to toxic contaminants and harmful physical agents in the workplace and in the environment. Students will develop an understanding of the ethical issues confronting industrial hygienists and other health professionals.

EGMN 507. Law and Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the school of Engineering, or by permission of instructor. The course proposes to acquaint the student with legal concepts that affect the engineering community and enable the student to understand how technical and scientific regulations are promulgated and how interest groups attempt to ensure that regulations consider their positions. In addition, the course introduces intellectual property law: patents, copyrights and trademarks.

EGMN 508. Lean Manufacturing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. The objective of the class is to introduce lean thinking -- defined as a systematic, logical method of identifying and eliminating waste using continuous assessment. The classes focus on managing flow, identifying and eliminating waste, problem-solving, and product and process design.

EGMN 509. Advanced Lean Manufacturing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. The course builds on the knowledge gained in lean manufacturing. The class allows the student to use their lean tools in a real manufacturing environment. The course reviews autonomation, load leveling, distribution, logistics, flow and added work, among many other topics. At the end of the course students will be able to take the Lean Bronze Certificate Test, given by the Society of Manufacturing Engineers.

EGMN 510. Probabilistic Risk Assessment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: senior or graduate standing in the School of Engineering, or permission of instructor. An introduction to probabilistic risk assessment methods as applied to nuclear power plants. Students will receive hands-on experience in PRA methods by designing and building a PRA model for an operational nuclear power plant. Students will use state-of-the-art software to design a nuclear plant model, using event trees, fault trees, industry failure and unavailability data, and current human reliability analysis methods. Using the completed model, students will calculate and use appropriate risk metrics in typical applications.

EGMN 515. Vibrations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Provides students with vibrations theory and practical applications for machines and structures necessary (a) to perform analysis and evaluation of vibrations problems and (b) to recognize suspicious results from canned computer software. Emphasis placed on the formulation of governing differential equations, solution methods, evaluation of results and interpretation of response characteristics of discrete mass systems and continuous mass systems. Work and energy methods, variational methods, and Lagrange's Equations will be used to formulate problems. Solution methods will use exact and approximate methods, including eigensolution methods. Applications to the vibrations of various mechanical systems will use computational techniques, computer simulation and analysis.

EGMN 518. Advanced HVAC. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or by permission of instructor. The course intends to reinforce the fundamentals of HVAC systems and apply them to research topics. Student will review the basics of HVAC systems; the use of psychrometric charts to deal with various moist-air processes; indoor environment health, thermal comfort and indoor air quality control; heat transmission in building structures; solar irradiation; basic space heating and cooling load calculations; and space air distribution and related equipment.

EGMN 525. Feedback Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: experience using MATLAB software; EGMN 315 and EGMN 410, with a minimum grade of C in both; graduate standing in the School of Engineering; or permission of instructor. In-depth study of the fundamentals of feedback control systems theory and design. Topics covered include transfer function modeling, system stability and time response, root locus, Bode and Nyquist diagrams, lead, lag, and PID compensators.

EGMN 530. System Analysis of the Nuclear Fuel Cycle. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGMN 355, with a minimum grade of C, graduate standing in the School of Engineering or permission of instructor. Provides an in-depth technical and policy analysis of various options for the nuclear fuel cycle. Topics include uranium supply, enrichment fuel fabrication, in-core physics and fuel management of uranium, thorium and other fuel types, reprocessing, and waste disposal. Also covered are the principles of fuel-cycle economics and the applied reactor physics of both contemporary and proposed thermal and fast reactors. Nonproliferation aspects, disposal of excess weapons plutonium and transmutation of actinides and selected fission products in spent fuel are examined. Several state-of-the-art computer programs are provided for student use in problem sets and term papers.

EGMN 545. Energy Conversion Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGMN 204 and EGMN 301, with a minimum grade of C in both, graduate standing in the School of Engineering, or permission of the instructor. Quantitative and qualitative study of traditional and alternative systems used to generate electricity. Topics include combustion, coal-fired boilers, nuclear reactors, steam turbine blading, gas turbine combustors, turbo-generator design, internal combustion engines, solar thermal systems, photovoltaic devices, wind energy, geothermal energy and fuel cells. Additional topics of interest to the students may be discussed.

EGMN 550. Energy and Sustainability. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires senior or graduate standing in the School of Engineering or permission of instructor. This course will explore the various available energy resource options and technologies with a focus toward achieving sustainability on a local, national and global scale. The course will examine the broader aspects of energy use, including resource estimation, environmental effects, interactions among energy, water and land use, social impacts, and economic evaluations. Students will review the main energy sources of today and tomorrow, from fossil fuels and nuclear power to biomass, hydropower and solar energy, including discussions on energy carriers and energy storage, transmission, and distribution.

EGMN 551. Experimental Methods for Engineers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: senior or graduate standing in the School of Engineering or permission of the instructor. An introduction to design of experiments theory, DoE and methods such as six-sigma and factorial experimental design to engineering projects. Provides students with the necessary background to plan, budget and analyze an experiment or project.

EGMN 555. Smart Materials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Covers various smart materials, such as shape memory alloys and piezoelectric and magnetostrictive materials, current research in material development and diverse applications in areas such as medicine, automobiles and aerospace. The aim of the course is to bridge the gap between different areas of material development, characterization, modeling and practical applications of smart materials.

EGMN 560. Monte Carlo Simulations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. The course covers key aspects of computer modeling and simulation with the emphasis on statistical resampling and Monte Carlo techniques. Students will complete a number of modeling projects utilizing programming languages commonly used in the nuclear industry. As such the course includes gaining a basic proficiency in the appropriate programming language, including the development of good programming practices.

EGMN 565. Design Optimization. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGRM 420 and 421, with a minimum grade of C in each, graduate standing in the School of Engineering, or permission of instructor. Focuses on providing students with a methodology and set of skills to apply in improving engineering components, systems and processes. The design of better products and processes is a fundamental goal of all engineering.

EGMN 566. Advanced Computer-aided Design and Manufacturing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EGMN 420, EGMN 421, EGMN 425 and EGMN 426, with a minimum grade of C in each, graduate standing in the School of Engineering or permission of instructor. Provides students with an understanding of how modern computer techniques can enhance the generation, analysis, synthesis, manufacturing and quality of engineering products. The design and manufacture of better products and processes is a fundamental goal of all engineering disciplines.

EGMN 568. Robot Manipulators. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the School of Engineering or permission of instructor. Provides students with a basic knowledge in the dynamic analysis and control of robot manipulators. Topics include Jacobian analysis, manipulator dynamics, linear and nonlinear control of manipulators, force control of manipulators, robot manipulator applications and an introduction to telemanipulation.

EGMN 570. Effective Technical Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to juniors, seniors or graduate students in the School of Engineering or with permission of instructor. The course will involve intensive study of different aspects of technical communications. Critical reading and writing skills will be developed particularly for technical essays, targeted for both educated and specialized audience. Nontechnical writing will be used as an inspiration for technical writing. Other aspects of technical communications will also be covered.

EGMN 571. Introduction to Computational Fluid Dynamics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGMN 301 with a minimum grade of C, graduate standing in the School of Engineering or permission of the instructor. Students will become familiar with basic aspects of CFD, including characteristics of the governing equations, finite-difference and finite-volume solution methods, implicit versus explicit solution algorithms, grid generation, and numerical analysis. Emphasis placed on mechanical, chemical and bioengineering systems. The final course project will emphasize issues of current research such as biofluid mechanics, medical devices and MEMS.

EGMN 573. Engineering Acoustics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the School of Engineering or permission of the instructor. Designed to equip students to perform design work, testing and research in structural acoustics and vibrations. Applications from the fields of automotive, aerospace, marine, architectural, medical equipment and consumer appliance industries will be investigated.

EGMN 574. Nuclear Safeguards, Security and Nonproliferation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. This course will explore the political and technological issues involved with nuclear safeguards, security and nonproliferation. Topics studied will include the history of nuclear weapons development, description and effects of weapons of mass destruction, nuclear material safeguards, protection of nuclear materials, proliferation resistance and pathways in the nuclear fuel cycle, international and domestic safeguards, nuclear terrorism, and safeguards measurement techniques for material accountancy programs and physical protection mechanisms.

EGMN 575. Fast Breeder Reactors. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with senior or graduate standing in the School of Engineering or by permission of instructor. This course will examine the physical, technical and economic features of fast breeder reactors. In particular, the course will study the need for fast reactors and their design objectives, typical core design principles, and important plant systems. The course will also discuss the major nuclear safety topics and their design approaches.

EGMN 580. Flow Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EGMN 301 with a minimum grade of C, graduate standing in the School of Engineering or permission of instructor. Passive, active and reactive flow management strategies to achieve transition delay/advance, separation control, mixing augmentation, drag reduction, lift enhancement and noise suppression. Unified framework for flow control. Futuristic reactive control methods using MEMS devices, soft computing and dynamical systems theory.

EGMN 591. Special Topics in Engineering. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Prerequisite: senior or graduate standing in the School of Engineering, or permission of the instructor. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of research training.

EGMN 602. Convective Heat Transfer. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate standing in the School of Engineering, or permission of instructor. In-depth quantitative study of convective heat transfer. Topics include laminar boundary layer flow, laminar duct flow, external natural convection, internal natural convection, transition to turbulence, turbulent boundary layer flow, turbulent duct flow, free turbulent flows, convection with change of phase, convection in porous media.

EGMN 603. Mechanical and Nuclear Engineering Dynamic Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in mechanical and nuclear engineering. This course presents the technical foundation for application and use of dynamic systems and presents methods to formulate the governing differential equations of such systems and to obtain realistic analytical and numerical solutions. The organization of the course presents theory and methods and specific applications for typical dynamic systems.

EGMN 604. Mechanical and Nuclear Engineering Materials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course consists of advanced topics in both fundamental and applied materials science including solid state fundamentals, crystal structure, diffraction in crystals, postulates of quantum mechanics, Bloch functions and energy bands, Fermi distributions, classification and processing of materials, alloys and phase diagrams, defects, dislocation dynamics, solid state diffusion, thermal and mechanical properties, corrosion, high temperature deformation mechanisms, basics of fracture mechanics, fundamentals of ionization radiation, irradiation effects on material properties, and materials selection for extreme environment applications.

EGMN 605. Mechanical and Nuclear Engineering Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in mechanical and nuclear engineering. The course covers advanced topics in applied mathematics most important for solving practical problems in mechanical and nuclear engineering. Topics include Fourier analysis, partial differential equations, boundary value problems, series solutions, complex analysis, conformal mapping, complex analysis and potential theory, applications in fluid mechanics, vibrations, and mechanical and nuclear engineering problems.

EGMN 606. Mechanical and Nuclear Engineering Continuum Mechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in mechanical and nuclear engineering. The topics include scalars, vectors and tensors; indicial notation; transformation law; principal values and directions; tensor fields; integral theorems of Gauss and Stokes; stress; Mohr's circle; strain; kinematics of deformation and motion; rate of deformation; general principles (continuity, momentum, energy); constitutive equations; linear elasticity; Hooke's law; three-dimensional elasticity; classical fluids; Navier-Stokes equations; Bernoulli equation; flow (viscous, steady, irrotational).

EGMN 607. Heat and Mass Transfer Theory and Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in mechanical and nuclear engineering. A solid theoretical and applied understanding of heat and mass transfer is critical for training competent mechanical and nuclear engineers. This course will provide students with a theoretical understanding of the heat transport processes of conduction, convention and radiation as well as an understanding of parallels with mass transfer. Solution techniques will be both analytical and numerical, consistent with problems faced by modern engineers. Applications in the field of mechanical engineering include the design of cooling systems for automobiles, conventional power plants, heat engines and computers. Applications in the field of nuclear engineering include maintaining nuclear core temperatures and nuclear plant heat dissipation. Mass transfer applications include any process involving multiple species (e.g., two gases) as well as medically oriented transport problems (e.g., blood oxygenation), which are frequently encountered when developing materials or medical devices. Specific topics to be covered include 1D conduction, 2D and 3D conduction, transient conduction, external forced convection, internal forced convection, convection with phase change, thermal radiation, and principles of mass transfer (diffusion and advection).

EGMN 608. Solid Mechanics and Materials Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the School of Engineering or permission of the instructor. Studies of stresses and strains in two- and three-dimensional elastic problems. Failure theories and yield criteria. Analysis and design of load-carrying members, energy methods and stress concentrations. Elastic and plastic behavior, fatigue and fracture, and composites will be discussed.

EGMN 609. Advanced Characterization of Materials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Study of the physical properties of a wide range of materials by advanced microscopy techniques including electron and scanning probe-based microscopy. Advanced study of deformation and failure in materials including characterization by hardness, fracture toughness and tensile testing, as well as X-ray diffraction.

EGMN 610. Topics in Nuclear Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. A survey covering the scope of nuclear engineering. Concepts of atomic and nuclear structure, mass and energy, nuclear stability, radioactive decay, radioactivity calculations, nuclear reactions, interaction of radiation (neutrons and photons) with matter, fission chain reaction, neutron diffusion, nuclear reaction theory, reactor kinetics, health physics, reactor power plants (PWR and BWR), waste disposal. Required first course for graduate students in nuclear engineering track who enter with degrees in other disciplines; suitable as a technical elective for other graduate engineering tracks.

EGMN 612. Advanced Computational Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Exposes students to the fundamentals of modern numerical techniques for a wide range of linear and nonlinear elliptic, parabolic and hyperparabolic partial differential equations. Topics include equation characteristics; finite difference, finite volume and finite element discretization methods; and direct and iterative solution techniques. Applications to engineering systems are presented, including fluid dynamics, heat transfer and nonlinear solid mechanics.

EGMN 620. Reactor Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. The neutronics behavior of fission reactors, primarily from a theoretical, one-speed perspective. Criticality, fission product poisoning, reactivity control, reactor stability and introductory concepts in fuel management, followed by slowing-down and one-speed diffusion theory.

EGMN 625. Advanced Modeling and Simulations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or by permission of instructor. Use of finite element method to solve applied engineering problems at an advanced level. Special focus will be largely on solid mechanics and, to a lesser degree, on thermal problems. Topics to be covered include, but are not limited to, material and geometric nonlinearities, contact problems, dynamic problems and application of constraint equations. Commercially available finite element method software ANSYS will be utilized. Students will learn how to use ANSYS at an advanced level through utilizing commands and basic programming features.

EGMN 627. Advanced Manufacturing Simulations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Advanced mechanics of the manufacturing processes, their modeling and simulation. Fundamentals of process modeling and use of computational tools. Details and governing theory behind the construction of numerical analysis tools such as FEA will not be provided. However, the intelligent use of this kind of FEA tool in the solution of industrial problems will be taught in addition to analytical methods in rapid assessment of manufacturing processes and systems.

EGMN 630. Technology, Security and Preparedness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of the role of technology in detecting and defeating terrorism. The course begins with a detailed review of weapons of mass destruction including chemical, biological and radiological devices. This is followed by a review of the various technologies currently being developed and deployed to detect the presence of terrorist weapons and associated activities. These technologies include chemical sensors, biosensors and radiation detectors, portal monitors, satellite and infrared imaging systems, as well acoustic sensors and magnetometers.

EGMN 640. Nuclear Safety. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Physical and biological aspects of the use of ionizing radiation in industrial and academic institutions; physics principles underlying shielding instrumentation, waste disposal; biological effects of low levels of ionizing radiation.

EGMN 650. Nuclear Radiation and Shielding. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Basic and advanced concepts in radiation sources, gamma ray and neutron shielding, geometry factors in shielding, computational techniques (such as Monte Carlo and discrete ordinates), special topics (such as shield heating, duct steaming and albedo theory) and practical aspects.

EGMN 655. Nuclear Power Plants. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Descriptions of mechanical features (containment, core design, steam generation, Rankine and Brayton cycles) of PWR and BWR power plants. Reactor core heat generation. Thermal analysis of fuel pins, fuel elements, flow channels and reactor core. Single- and two-phase heat transfer. Single- and two-phase fluid mechanics. Steady-state and unsteady-state thermodynamic analysis.

EGMN 661. Computational Fluid Dynamics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the School of Engineering, or permission of instructor. Teaches students how to perform two- and three-dimensional fluid flow and heat transfer analyses. Students will be able to understand and use most of the commercial flow analyses applied in industry today.

EGMN 662. Advanced Turbomachinery Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Teaches students the principles used in analyzing/designing compressors and turbines. Students will be expected to design a gas turbine to meet specific mission requirements. Upon completion of the course, students will be able to understand the design systems and techniques used in the aeropropulsion and gas turbine industries.

EGMN 663. Viscous Flows. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Designed to introduce graduate students to the fundamentals and the theoretical underpinnings of viscous fluid flows. An extensive project will be included as part of this class.

EGMN 664. Advanced Fluid Mechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the School of Engineering or permission of instructor. Covers the principles necessary to analyze viscous flow. Students learn how to formulate solutions to general viscous flow problems.

EGMN 665. Advanced Biofluid Mechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. Emphasizes the application of fluid mechanics to understand the properties of biological materials pertaining to the human body. This objective will be achieved through the application of fundamental laws (mass, momentum and energy) that govern fluid mechanics. Emphasis will be on respiratory flow dynamics, biofluid measurement techniques, steady and unsteady blood flow, flow through biodevices, turbulence, and mass transport with physiologic boundary conditions.

EGMN 680. Advanced Flow Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing in the School of Engineering or with permission of instructor. In-depth passive, active and reactive flow-management strategies to achieve transition delay/advance, separation control, mixing augmentation, drag reduction, lift enhancement and noise suppression. Unified framework and theoretical underpinnings of flow control. Futuristic reactive control methods using MEMS devices, soft computing and dynamical systems theory. An extensive project will be included as part of this class. Not open to undergraduate students. Mechanical engineering students may use EGRM 580 or EGRM 680 (but not both) to meet the requirements for the M.S. and/or Ph.D. degrees. Students cannot receive credit for both EGRM 580 and EGRM 680.

EGMN 690. Mechanical and Nuclear Engineering Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to students with graduate standing. Mechanical engineering graduate students will attend a weekly one-hour research seminar. The topic and speaker will change each week in order to cover a broad range of subjects at the forefront of mechanical engineering research. The objective is to expose students to research topics and scholars in the field of mechanical engineering. Graded as satisfactory/unsatisfactory.

EGMN 691. Special Topics in Engineering. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. An advanced study of selected topic(s) in engineering. See the Schedule of Classes for specific topics to be offered each semester.

EGMN 692. Independent Study. 1-3 Hours.
Semester course; 1-3 lecture and 1-3 laboratory hours. 1-3 credits. Prerequisites: graduate standing and consent of instructor. The student must identify a faculty member willing to supervise the course and submit a proposal for approval to the appropriate track's graduate committee. Investigation of specialized engineering problems through literature search, mathematical analysis, computer simulation and/or experimentation. Written and oral reports, final report and examination are required.

EGMN 697. Directed Research in Mechanical and Nuclear Engineering. 1-15 Hours.
Semester course; variable hours. 1-15 credits. Prerequisite: graduate standing or permission of instructor. Research directed toward completion of the requirements for the M.S. or Ph.D. in Mechanical Engineering, under the direction of a mechanical engineering faculty member and advisory committee. Graded S/U/F.

College of Health Professions

Allied Health Professions (ALHP)

ALHP 573. Teaching in Health Professional Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of the relationships between health education and higher education in general, current essentials, standards in education for the health professions and theoretical approaches to the implementation of these standards in both academic and clinical learning. Emphasis will be placed on modes of adapting to future needs of the professions.

ALHP 582. Supervision in the Allied Health Professions. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Study of the supervisory process and staff development, training in communication and interpersonal skills, and public relations within the health facility.

ALHP 591. Special Topics. 1-4 Hours.
Semester course; 1-4 credits. Prerequisite: Permission of instructor. Interdisciplinary study through lectures, tutorial study or independent research of selected topics not provided in other courses. Graded as Pass/Fail.

ALHP 594. Health Education Practicum. 1-6 Hours.
Semester course; 1 lecture and 4 laboratory hours. 1-6 credits. Preparation, presentation and evaluation of selected educational experiences in the appropriate graduate program. Section 801: general; Section 802: nurse anesthesia; Section 803: clinical laboratory science.

ALHP 596. Supervisory and Administrative Practicum in Allied Health Clinics. 1-9 Hours.
Semester course; 60 clinical hours per credit. 1-9 credits. Prerequisite: Permission of instructor. The course is designed for the student who will be assuming supervisory and administrative roles. Areas to be covered include clinical personnel management, budgeting and ordering of materials and equipment, consultation with physicians, developing and troubleshooting clinical methods, designing job descriptions and implementation of quality control programs. Section 01: Clinical Laboratory Sciences Section 02: Physical Therapy.

ALHP 701. Health Services Delivery Systems. 3 Hours.
Semester course; 3 credits. Examines the structure and function of the U.S. health-care delivery system, the concepts and processes of health and illness, the institutional and individual providers of health services and related theory. Focuses on interdisciplinary care. Emphasizes meeting the unique needs of ethnically and culturally diverse populations.

ALHP 702. Finance and Economic Theory for Health Care. 3 Hours.
Semester course; 3 credits. Focuses on foundational concepts of micro-economic theory and their application in analyzing health care; understanding the structure and dynamics of health-care markets; and on monitoring and controlling the allocation of resources within health organizations. Emphasizes each of the health-care disciplines and how finance and economics affect the practice of delivery and evaluation.

ALHP 708. Ethics and Health Care. 3 Hours.
Semester course; 3 credits. Applies the principles of biomedical and health-care ethics to develop a more informed understanding of ethical decision making in the formulation of health-care policy as well as within the clinical environment. Focuses on utilizing and searching biomedical ethics literature, current issues in biomedical ethics, the discipline and process of ethical reflection and case consultation.

ALHP 712. Curriculum and Communication Design for Health Care Professionals. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Required course. Examines various aspects of curriculum development, including instructional design and use of multimedia technology for teacher-learner communication and learner growth and development pertinent to doctoral education. Covers relevant learning theories in higher education and implications on curriculum design. Requires students to develop a Web-based interactive, multimedia course.

ALHP 716. Grant Writing and Project Management in Health Related Sciences. 3 Hours.
Semester course; 3 credits. Examines fundamentals of allied health grant writing and proposal preparation in the health related sciences, including funding source determination, responding to an RFP, basic elements of a proposal, proposal review procedures and allocation processes. Requires development of a complete proposal and critique of existing proposals.

ALHP 718. Health Informatics. 3 Hours.
Semester course; 3 credits. Analyzes current information and management systems from an allied health sciences perspective. Emphasizes knowledge representation in health care, information needs, storage and retrieval, clinical information systems, standards of health information management and the evaluation of information management systems. Stresses the efficient and innovative use of technology.

ALHP 760. Biostatistical Methods for Health Related Sciences. 3 Hours.
Semester course; 3 credits. Examines basic concepts and techniques of statistical methods, enabling individuals to conduct scientific inquiry as well as critical appraisal of the scientific literature. Includes the collection and display of information, data analysis and statistical measures; variation, sampling and sampling distributions; point estimation, confidence intervals and tests of hypotheses for one- and two-sample problems; principles of one-factor experimental design, one-way analysis of variance and multiple comparisons; and correlation and regression analysis.

ALHP 761. Health Related Sciences Research Design. 3 Hours.
Semester course; 3 credits. Covers the design of experimental and quasi-experimental studies in the health-care field. Emphasizes issues related to measurement, validity of designs, sampling and data collection. Focuses on the logic of causal inference, including formulation of testable hypotheses, and the design, methods and measures that facilitate research.

ALHP 762. Multivariate Statistical Methods for Health Related Sciences Research. 3 Hours.
Semester course; 3 credits. Examines multivariate statistical analysis and evaluation research methods with application to health related science research. Emphasizes data reduction techniques, factor analysis, principle components, discriminant analysis and logistic regression to analyze data in the health field.

ALHP 763. Clinical Outcomes Evaluation for Health Related Sciences. 3 Hours.
Semester course; 3 credits. Prerequisites: ALHP 760, 761 and 762. Prepares students to design, implement and interpret studies that evaluate the outcome and effectiveness of health services delivery. Emphasizes identification of emerging trends in health related sciences research, identification of meaningful research questions based on existing information and the use of primary and secondary data to assess outcomes.

ALHP 764. Advanced Methods for Health Sciences Research. 3 Hours.
Semester course; 3 credits. Examines the application of multivariate statistical analysis and evaluation methods to health related sciences research. Emphasizes advanced statistical methods (e.g., LISREL, Event History Analysis) and design to analyze panel data in the health field. Elective course.

ALHP 781. Doctoral Seminar in Health Related Sciences. 3 Hours.
Semester course; 3 credits. Prerequisite: Permission of instructor. Student's desired topic of study must be identified and approved prior to enrollment. Studies specific topics in the area of the student's specialty track.

ALHP 792. Independent Study. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 6 credits. Prerequisite: Permission of instructor. Offers special individual study or research leading toward investigation in specialty track. Conducted under the guidance of a faculty adviser.

ALHP 793. Research Practicum. 3 Hours.
Semester course; 3 credits. Offers supervised investigation of selected problems in the area of the student's specialty track. Includes conducting and analyzing field research.

ALHP 890. Dissertation Seminar. 3 Hours.
Semester course; 3 credits. Deals with general purpose, content and functions of the dissertation process related to the student's specialty track. Leads to the preparation of dissertation proposal.

ALHP 899. Dissertation Research. 1-9 Hours.
Semester course; variable hours. Variable credit. Minimum of 9 semester hours required for Ph.D. Prerequisites: Completion of required course work and comprehensive examination. Covers dissertation research under the direction of a faculty adviser.

Clinical Laboratory Sciences (CLLS)

CLLS 500. Concepts and Techniques in Clinical Laboratory Science. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: Permission of instructor. Restricted to candidates in the categorical master's program. Presents the basic theoretical concepts, laboratory techniques and skills employed in the areas of clinical chemistry, hematology, immunohematology and microbiology.

CLLS 501. Instrumental Methods of Analysis I. 2-4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 2-4 credits. Prerequisite: Permission of instructor. A study of modern research and clinical laboratory instrumentation and procedures. Principles, theory and comparison of laboratory instruments are discussed along with the factors affecting their operation. Laboratory exercises are designed to demonstrate the practical applications of the instruments in the research and clinical laboratory. Areas covered include basic electronics, principles of photometry, spectrophotometry, fluorometry, flame emission photometry, atomic absorption spectrophotometry and computerized instrumentation.

CLLS 502. Instrumental Methods of Analysis II. 2-4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 2-4 credits. Prerequisite: Permission of instructor. A study of modern research and clinical laboratory instrumentation and procedures. Principles, theory and comparison of laboratory instruments are discussed along with the factors affecting their operation. Laboratory exercises are designed to demonstrate the practical applications of the instruments in research and clinical laboratory. Areas covered include electrophoresis, chromatography, particle counters, radio-isotope counters and clinical laboratory automation.

CLLS 580. Principles of Education/Management. 1-3 Hours.
Semester course; 2 lecture and 2 practicum hours. 1-3 credits. Introduces fundamental educational theories and practice, principles of management and employee relations and health-care issues from a global perspective with an emphasis on multicultural diversity. Stresses the application in the clinical laboratory. Requires a practicum in education and in management following the completion of the didactic portion.

CLLS 595. Clinical Practicum. 1-4 Hours.
Semester course; 80-320 clock hours. 1-4 credits. Prerequisite: At least one of the following: CLLS 301-302, 306 and 310, 307-308, 311-312, or by permission of instructor. Individual participation in a hospital laboratory in a selected specialty area: clinical chemistry, hematology, microbiology or immunohematology. Students gain practical experience in the performance of procedures and use of instruments by working with the clinical staff. After gaining competence, the students are expected to properly perform and sign out routine laboratory work under supervision. Based on adviser's recommendation and student's past experience, the course may be taken for less than four credits. Graded as pass/fail.

CLLS 601. Theoretical Blood Banking. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Permission of instructor. A comprehensive study of the blood groups in man, including biochemistry, genetics and clinical significance. Topics relating to problems with antibodies to the blood group antigens are discussed.

CLLS 602. Molecular Diagnostics in Clinical Laboratory Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students in the M.S. in Clinical Laboratory Sciences' advanced master's track or permission of instructor. Provides the basic principles and techniques of molecular diagnostics and information for establishing a molecular diagnostics laboratory. Examines the utilization of molecular techniques in the clinical laboratory for patient diagnosis and therapy. Emphasizes the use of these techniques in the areas of immunology, microbiology, hematology/oncology, and inherited genetic disorders.

CLLS 605. Advanced Hematology. 2-4 Hours.
Semester course; 2 lecture and 2 laboratory hours. 2-4 credits. Prerequisite: Permission of instructor. Discusses advanced laboratory techniques used to analyze blood dyscrasias and hemostatic disorders. Students also may perform related laboratory tests.

CLLS 608. Laboratory Diagnosis of Infectious Diseases. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Applies an organ system approach to the laboratory diagnosis of infectious diseases. Emphasizes diagnostic methods to verify infections because of pathogenic micro-organisms and includes related diagnostic microbiology laboratory issues. Utilizes a distance learning format.

CLLS 610. Interpretative Clinical Hematology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: Permission of instructor. Principles of hematopoiesis and related pathological and pathophysiological correlation of hematological disorders are discussed.

CLLS 611. Analytical Techniques for Clinical Mass Spectrometry. 2 Hours.
6-week summer session; 12 lecture and 36 laboratory contact hours. 2 credits. Enrollment restricted to student admitted to the M.S. in Clinical Laboratory Sciences program or by permission of the instructor. Focuses on the proper utilization of chemicals and equipment required for the calibration, quality control and operation of clinically relevant mass spectrometry systems. Emphasizes calculations and demonstration of proficiency with quantitative techniques.

CLLS 612. Mass Spectrometry Systems for Clinical Analyses. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Prerequisite: CLLS 611 or permission of the instructor. Focuses on the principles of chemical and instrumental analysis relevant to the detection and quantitation of clinically relevant analytes using mass spectrometry systems. Emphasizes the clinical laboratory applications of different types of mass spectrometry systems, preanalytical sample preparation, and integration of chromatography and mass spectrometry.

CLLS 613. Mass Spectrometry Assay Development for In Vitro Diagnostics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisites: CLLS 611 and CLLS 612 or permission of the instructor. Focuses on the principles of assay development and evaluation of methods for the measurement of clinically relevant analytes using chromatography-mass spectrometry systems. Emphasizes "best practices" as found in CLSI, SOFT and FDA guidance documents.

CLLS 627. Advanced Concepts in Immunology and Immunohematology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLLS 306, 310 and 496. Presents advanced topics in clinical immunology and immunohematology. Focuses on the integration of advanced concepts in the evaluation of laboratory data and solving clinical and methodological problems related to autoimmune diseases, ABO discrepancies, compatibility testing, hemolytic disease of the fetus and newborn and transfusion reactions.

CLLS 628. Advanced Concepts in Microbiology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 307 and 308; and CLLS 496 or 595. Advances study of pathogenic microbiology principles. Includes application of laboratory data and techniques to solve clinical microbiology problems.

CLLS 629. Advanced Concepts in Hematology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 302, and CLLS 485 or 595. Focuses on developing and expanding the knowledge acquired in the prerequisite courses in hematology and hemostasis. Incorporates case study evaluations, challenging current hematology topics in the literature and the integration of assessing laboratory data and clinical problems. Emphasizes the development of skills in critical thinking and analyzing clinical data.

CLLS 630. Advanced Concepts in Clinical Chemistry and Instrumentation. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: CLLS 311 and 312; and CLLS 483 or 595. Focuses on advanced concepts in clinical chemistry, including endocrinology, measurement of vitamins and tumor markers, method evaluation and laboratory and hospital information systems. Integrates the basic knowledge and skills acquired in the undergraduate sequence of courses with advanced concepts in clinical chemistry/instrumentation to analyze the more complex clinical and analytical problems presented by the aforementioned topics. Includes the design and conduct of library research and laboratory experiments, and data analysis to generate recommendations that are practical and applicable in a real clinical chemistry service.

CLLS 690. Clinical Laboratory Sciences Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of current research and topics of interest by the departmental faculty, graduate students and visiting lecturers.

CLLS 691. Special Topics in Clinical Laboratory Sciences. 1-4 Hours.
Semester course; 1-4 credits. This course provides for lectures, tutorial studies and/or library assignments in specialized areas not available in formal courses or research training.

CLLS 694. Molecular Diagnostic Practicum I. 8 Hours.
Semester course; 640 clock hours. 8 credits. Prerequisite: permission of instructor. Provides direct observation and practice in a molecular diagnostics laboratory with emphasis on nucleic acid extraction and molecular amplification techniques. Develops proficiency at performing, analyzing and reporting test results. Graded as pass/fail.

CLLS 695. Molecular Diagnostic Practicum II. 4 Hours.
Semester course; 320 clock hours. 4 credits. Prerequisite: permission of instructor. Provides direct observation and practice in molecular diagnostics laboratory. Focuses on molecular hybridization and human identity analyses. Develops proficiency at all stages of nucleic acid analyses including performing, analyzing and reporting test results. Introduces practice issues involved in management of a molecular diagnostics laboratory. Graded as pass/fail.

CLLS 696. Advanced Blood Bank Practicum. 2 Hours.
6 laboratory hours. 2 credits. Prerequisite: permission of instructor. A laboratory course with practical experiences in resolving complex blood group serological problems and discussion of these problems. Donor phlebotomy, processing of donor units, component preparation and instruction of undergraduate clinical laboratory sciences students also are performed.

CLLS 761. Research Methodology in Clinical Laboratory Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the principles of scientific research as applicable to problems encountered in the clinical laboratory sciences. Also focuses on developing a draft research proposal that would be the foundation for a project that would satisfy the research requirement for the master's degree in clinical laboratory sciences.

CLLS 790. Research in Clinical Laboratory Sciences. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. degree.

Gerontology (GRTY)

GRTY 501. Physiological Aging. 3 Hours.
3 credits. This course is taught at an introductory level in contrast to the more substantive background required for GRTY 601. Distinguishes between normal aging and those chronic illnesses often associated with aging in humans. This course would be valuable to those interested in the general processes of human aging.

GRTY 510. Aging. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces the student to the biological, psychological, social, ethical, economic and cultural ramifications of aging. Presents an interprofessional approach to the complex issues and realities of aging. Discusses aging concepts and biopsychosocial theoretical frameworks relevant to the field of aging studies.

GRTY 601. Biological and Physiological Aging. 3 Hours.
3 credits. Biological theories of aging; cellular, physical, systemic and sensory change; health maintenance.

GRTY 602. Psychology of Aging. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Enrollment requires permission of instructor. Students must complete social sciences research methods before taking this course.Psychological adjustment in late life; special emphasis on personality, cognitive and emotional development; life crises associated with the aging process. Crosslisted as: PSYC 602.

GRTY 603. Social Gerontology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Focuses on the sociopsychological and sociological aspects of aging. Various sociopsychological and social theories of aging will be discussed. The course will provide a broad overview of several general topics such as the demography of aging, politics and economics of aging, and cross-cultural aspects of aging. The course will offer an in-depth analysis of particular role changes that accompany aging (i.e., retirement, widowhood, institutionalization).

GRTY 604. Problems, Issues and Trends in Gerontology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Covers a broad range of topics of critical interest to practitioners, policymakers and researchers working with older persons. Explores how societal trends affect the health and social services systems. Recognizes the importance of interdisciplinary approaches to the study of aging issues: Insights from practitioners and the knowledge of researchers will be combined to investigate viable responses to emerging trends. Provides a multifaceted view of these issues based on research expertise and practical experience. Students will experience a visit to the General Assembly and will follow and critically evaluate current aging-related legislation in state government.

GRTY 605. Social Science Research Methods Applied to Gerontology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate statistics. Application of social science methods and techniques to study of the aged; data sources; types of problems encountered; data analysis; research reporting; use of research findings.

GRTY 606. Aging and Human Values. 3 Hours.
3 credits. Identification and analysis of value systems of the aged, exploration of religious beliefs; death and dying; moral, ethical and legal rights; human values and dignity.

GRTY 607. Field Study in Gerontology. 1-5 Hours.
Semester course; variable hours. 1-4 credits. May be repeated to the required maximum of 4 credits. Focuses on identification and systematic exploration and study of a community-identified need, issue or task germane to the student's gerontology concentration with special attention given to funding opportunities and grant writing. Applies specific concepts and approaches to assessment analysis as determined in consultation with the student's program adviser. Implementation and evaluation of a terminal project and dissemination of the results through a portfolio collection, as well as potential professional presentation, grant submission or manuscript submissions. Graded as S/U/F.

GRTY 608. Grant Writing. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Provides the skills necessary to research and write a grant. Explores how to find grant funding opportunities through both private and public sources. Describes the process of preparing a proposal including writing the narrative and preparing a budget.

GRTY 609. Career Planning. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Focuses on the transition from academia to the professional role and workforce. Identifies individual strengths and evaluates career goals. Prepares students to deliver resumé and communication strategy for job seeking in the aging workforce.

GRTY 610. Gero-pharmacology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: undergraduate course in statistics. Discusses description of medication-related problems that may be experienced by older adults. Identifies strategies to prevent medication-related problems in older adults, defines the role of the pharmacist as a partner in resolving medication-related problems, applies the strategies for preventing medication-related problems to patient cases and evaluates the medication regimen for an older adult residing in assisted living.

GRTY 611. Death and Dying. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on questions surrounding death, dying and bereavement, with a special focus on developmental and cultural issues. Explores concepts through research, experiential learning and reflection.

GRTY 612. Recreation, Leisure and Aging. 3 Hours.
3 credits. An analysis of the quality and quantity of leisure in maximizing the quality of life for the older person. Focus will be on concepts of leisure; the interrelationship of leisure service delivery systems and other supportive services; the meaning of leisure to the elderly in the community and within institutional settings; and innovative programming.

GRTY 613. GLBT in Aging. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Explores the biopsychosocial and ecopolitical aspects of the intersection of aging and being a member of the gay, lesbian, bisexual and/or transgender-identified minority populations. Reviews normative aging factors in the context of being a member of the GLBT population. Discusses the intersection of these with such factors as race, socioeconomic status and other confounding factors.

GRTY 615. Aging and Mental Disorders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course deals with common psychological disorders and problems of late life, their etiology, methods of evaluating psychological status and intervention strategies that have been used successfully with older persons. Topics include epidemiology of psychological disorders and mental health service utilization; late-life stressors and crises; psychology of health, illness and disability; techniques and procedures in the evaluation of the older adult; functional and organic disorders; institutionalization; individual, group and family therapy; behavioral techniques; peer counseling and crisis intervention; and drugs and the elderly. Crosslisted as: PSYC 615.

GRTY 616. Geriatric Rehabilitation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the process in geriatric rehabilitation with an assessment, psychosocial aspects and rural issues in rehabilitation. Considers major disabling conditions in late life, and emphasizes the nature of the interdisciplinary rehabilitation process with aging clients.

GRTY 618. The Business of Geriatric Care Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Evaluates information and materials needed for a basic understanding of the fundamentals of geriatric care management. Distinguishes and critically evaluates the tasks required of a geriatric care manager and the knowledge and skills needed to perform those tasks. Compares and contrasts multiple geriatric care management business models.

GRTY 619. Geriatric Care Management Practicum. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Prerequisites: GRTY 601, GRTY/PSYC 602 and GRTY 603. Pairs a student with a geriatric care manager practicing in the field. Applies information learned in gerontology core classes to hands-on clinical experience with a geriatric care manager. Supervises field experience with clients, providing advocacy and supervision, and coordinating needs to ensure independence and safety.

GRTY 620. Geriatric Interdisciplinary Team Training. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Emphasizes interdisciplinary teamwork with a focus on geriatrics. Increases the awareness of the importance of interdisciplinary teamwork when working with older adults. Uses a case-focused approach to discuss care for older adults in a variety of settings, including acute care, long-term care, rehabilitation, PACE and home health care.

GRTY 621. Professional Writing. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides instruction on APA guidelines for writing and referencing articles in scholarly papers. Emphasizes critical thinking and awareness skills for reviewing journal articles.

GRTY 624. Community and Community Services for the Elderly. 3 Hours.
3 credits. A conceptual/theoretical overview of community focusing on the ecological, psychological and social dimensions of community and on communities of the aged. Crosslisted as: SOCY 624.

GRTY 625. Aging and the Minority Community. 3 Hours.
3 credits. An analysis of the relationship between the aging process and American minority communities. In addition to the sociological factors, the course will examine demographic, physiological and psychological aspects of minority aging. Attention also will focus on dominant social problems and federal policies toward the aged.

GRTY 627. Psychology of Health and Health Care for the Elderly. 3 Hours.
Focuses on factors in the etiology, course and treatment of illness; patient/practitioner relationship; patient compliance and psychosocial issues in terminal care.

GRTY 629. Spirituality and Aging. 2-3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. Explores the spiritual, psychological and social dynamics associated with aging. Provides special attention to the spiritual and emotional impact on caregivers who work with aging patients. Crosslisted as: PATC 629.

GRTY 638. Long-term Care Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the history and development of the long-term care continuum in the United States. Emphasizes assisted living and the knowledge and skills required to be a successful assisted living administrator. Utilizes the five domains of assisted living administration as the framework. Facilitates learning on leadership and management, with a focus on providing optimal, person-centered care and services to older adults living in a licensed and regulated environment.

GRTY 639. Human Resource Management and Leadership for Gerontologists. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an introduction and foundation to human resources in aging services geared toward administrative and entrepreneurial gerontologists. Emphasizes leadership theory and utilizes the human resource management domain of practice as a guide for structure. Emphasizes developing the culture of an organization to facilitate effective practices in managing a safe and healthy work environment. Reviews state and federal laws, rules and regulations. Allows students to apply skills through cases and exercises relevant to their intended career path.

GRTY 640. Financial Management for Gerontological Leaders. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an introduction and foundation to financial management in aging services geared toward administrative and entrepreneurial gerontologists. Utilizes the financial management domain of practice as structure for this course. Emphasizes creating and managing organizational finances and multiple payment systems. Reviews state and federal laws, rules and regulations. Allows students to apply skills through cases and exercises relevant to their intended career path.

GRTY 641. Survey of Psychological Assessment and Treatment of the Older Adult. 3 Hours.
3 credits. A combination didactic and skills training course; review of major treatment strategies and techniques for utilization with the older adult client with emphasis on group, individual and paraprofessional delivery systems; evaluation of crisis intervention and consultation team approaches; lectures, demonstration and classroom practice of actual treatment techniques. Crosslisted as: PSYC 641.

GRTY 642. Practicum in Clinical Geropsychology. 3 Hours.
3 credits. An initial practicum geared as an entry to the team practicum experience; focus on familiarizing the student with mental health service delivery systems for the elderly in the Richmond community; rotation through a limited number of facilities such as nursing homes, retirement centers, nutrition sites, emergency hotline services for the elderly and various agencies involved in deinstitutionalization; possible extended placement in a particular facility. Crosslisted as: PSYC 642.

GRTY 691. Topical Seminar. 3 Hours.
3 credits. Seminars on specialized areas of gerontological interest. Examples of special topic courses taught in previous years: nutrition and aging; psychophysiology and neurobiology of aging; wellness and aging; and preretirement planning.

GRTY 692. Independent Studies. 1-3 Hours.
1-3 credits. Directed in-depth independent study of a particular problem or topic in gerontology about which an interest or talent has been demonstrated.

GRTY 792. Independent Studies for Master's-/Ph.D.-level Students. 3 Hours.
Semester course; 3 credits. Independent study in selected area under supervision of gerontology faculty. Focuses on in-depth research and analysis of a major focus area of gerontology, leading to a comprehensive, publishable quality review paper. Emphasizes integrating previous graduate training into aging topical area.

GRTY 798. Thesis. 3-6 Hours.
3-6 credits. A research study of a topic or problem approved by the thesis committee and completed in accordance with the acceptable standards for thesis writing.

GRTY 799. Thesis. 3-6 Hours.
3-6 credits. A research study of a topic or problem approved by the thesis committee and completed in accordance with the acceptable standards for thesis writing.

Health Administration (HADM)

HADM 602. Health System Organization, Financing and Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the structure, functioning and financing of the U.S. health services system. Emphasizes foundational concepts for understanding and analyzing patterns of health and illness; health care cost, quality, access and utilization; workforce; competition in health care markets; and supplier, provider and payer effectiveness and efficiency.

HADM 606. Health Care Managerial Accounting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Financial Accounting. A foundation course covering health care financial accounting, financial statement analysis, budgeting, reimbursement, costing and short-term decision making. Emphasizes accounting concepts and using financial data in management of providers and payers.

HADM 607. Financial Management in Health Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HADM 606. Examines theory and techniques of corporate financial management as applied to health services providers and insurers including time value of money, working capital management, capital budgeting techniques, cash flow analysis and capital structure planning.

HADM 608. Seminar in Health Care Finance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADM 606 and HADM 607. Advanced studies of financial issues and the application of analytic tools in case studies and exercises. Designed to enhance and strengthen the knowledge and skills provided in the graduate program's foundation and required courses in accounting and finance.

HADM 609. Managerial Epidemiology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: undergraduate course in statistics. Introduces and uses analytical techniques to study and measure the health status of populations and to evaluate programs. Topics covered include health status measurement, evaluation design and managerial applications of epidemiology.

HADM 610. Health Analytics and Decision Support. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: undergraduate course in statistics. Applications of analytics and decision support to health services institutions. Applications of operations research and industrial engineering techniques using large institutional data for health care planning, control and decision-making including deterministic and stochastic decision analysis models and their use in health services administration.

HADM 611. Health Care Law and Bioethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents elements of law and legal principles as they apply to the administration of hospitals and health care systems. Emphasizes medical malpractice, medical-legal issues, informed consent, antitrust, health care business law and bioethics. Provides a legal foundation for the practice of health administration and clinical ethics through the use of case law and case analysis.

HADM 612. Information Systems for Health Care Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is restricted to majors only. Introduces and applies basic vocabulary, foundational principles and practical strategies associated with information systems relevant to the health care administrator. Examines health care information and information systems, technology standards and security, as well as management challenges.

HADM 614. Health Care Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Foundational theories, concepts and techniques of marketing applied to the distinctive properties of health care services. Emphasis placed on the role of marketing and aligning organizational capacity and health care needs; market analysis and planning; strategic marketing management; tactical marketing mix design; designing and managing service delivery systems and developing new offerings.

HADM 615. Health Care Politics and Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the political process with particular emphasis on the impact of politics on health care. Focuses on current political issues in the health field, examining conflicts and anticipating effects on the health system.

HADM 621. Advanced Medical Informatics: Technology-Strategy-Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on use of technology for improving operational efficiencies, quality of care and market competitiveness. Explores various application technologies within the framework of technology-strategy-performance including: telemedicine, cyber surgery, Web-enabled clinical information systems, clinical decision support systems, artificial intelligence and expert systems, and risk-adjusted outcome assessment systems.

HADM 624. Health Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum grade of B and ECON 211. Develops an understanding of (1) economics as a managerial tool in making choices or decisions that will provide for an optimum allocation of limited health care resources and (2) economics as a way of thinking about and approaching issues of public policy in financing and organizing health and medical services. Individual research on crucial or controversial issues in the health care field. Crosslisted as: ECON 624.

HADM 626. International Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of and/or introduction to international health. Focus is on the relationship between external factors and the health of populations.

HADM 638. Administration of Long-term Care Facilities and Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on unique knowledge and skills considered essential to effective long-term care administration. Emphasis is on the professional role of the long-term care administrator in providing for the health and social needs of the chronically ill and elderly. Applied skills in addressing the technical, human and conceptual problems unique to LTC are addressed through cases and field exercises.

HADM 645. Structure and Functions of Health Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Surveys concepts from organizational and management theories applicable to health organizations. Considers issues in organizational structure, strategy and processes for health care organizations.

HADM 646. Health Care Organization and Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the challenges of managing and leading health care organizations in the 21st century. Introduces concepts, vocabulary and ways of thinking to enable students to be more effective and insightful participants in organizational life in health care. Intended to provide the student with the basic knowledge necessary to benefit from the more detailed and advanced courses that follow in the curriculum.

HADM 647. Management of Health Care Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HADM 646. Analyzes the current state of management study and practice with the objective of achieving a balanced development of both knowledge and skills in solving the operations problems of health care institutions. Examines critically the managerial process; emphasizes leadership behavior and development, performance improvement, structure and purpose of health care organization subunits, interfunctional coordination, and organizational processes.

HADM 648. Strategic Management in Health Care Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HADM 647. Integrative seminar on strategic decision making in health care organizations. Considers the concepts and alternative models of strategic management, the strategic management process and the evaluation of strategic decisions.

HADM 649. Human Resources Management in Health Care. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents concepts in human resources management as applied to health care organizations. Explores relationships between human resources management and general management, nature of work and human resources, compensation and benefits, personnel planning, recruitment and selection, training and development, employee appraisal and discipline, organized labor issues, and employment and labor law.

HADM 661. Physician Practice Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Provides a practical overview of management skills and tools necessary to assist a physician group with an efficient service delivery organization. Discusses issues in the larger health care business environment that affect physician professional practice and the operational factors that define a successful organization now and in the future.

HADM 681. Clinical Concepts and Relationships. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Introduces students without clinical backgrounds (nursing, medicine, other) to medical and health care terminology. Reviews and discusses concepts that are related to health, healing, health professions and the experience of the patient. Examines the role of health professionals; emphasizes communication, problem solving and patient care improvements across professional boundaries.

HADM 682. Executive Skills I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Applied course in executive skills and behavior of the health care executive. Focus is on the health care executive leadership development and personal effectiveness.

HADM 683. Executive Skills II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: HADM 682. Advanced applied course in executive skill development. Focus is on the health care executive leader and development of skills relating to the external environment of health care organizations. Emphasizes relationships with physicians, governing boards, regulatory bodies, donors and other key stakeholders.

HADM 690. Departmental Research Seminar. 1-9 Hours.
Semester course; variable hours. Variable credit. Research seminar that focuses on research design and methods organized under a single topic or a series of related topics in health services research. Applied research training for master's-level students.

HADM 691. Special Topics in Health Services Organization and Research. 3 Hours.
3 lecture hours. 3 credits. Prerequisite: permission of instructor. Course is devoted to specialized content area for health administration. Examples include physician practice management and advanced managed care.

HADM 692. Independent Study in Health Administration. 1-3 Hours.
1-3 credits. Prerequisite: Permission of instructor. Special study conducted under the guidance of a faculty sponsor.

HADM 693. Internship in Health Administration. 3 Hours.
3 credits. Prerequisite: Completion of year one of the MHA curriculum. Restricted to dual-degree students (MHA/MD and MHA/JD). Assesses and examines administrative and organizational structures and cultures of the assigned site with perspectives from macro- and micro-organizational views. Students develop an understanding and gain knowledge of the complex health care industry and the internal and external factors that influence decision-making in the organization. Students will research and prepare a management project with recommendations to assist the organization in decision-making, policy development and/or performance improvement. Graded as S/U/F.

HADM 694. Practicum in Health Administration I. 5 Hours.
5 credits. Course is restricted to students completing a one-year administrative residency. Examines contemporary problems and issues in the organization, administration and evaluation of health services. Focuses on the application of alternative approaches to administrative problem solving. Emphasizes internal and external stakeholder interests and factors that influence decision-making in health care organizations. Graded as S/U/F.

HADM 695. Practicum in Health Administration II. 3-5 Hours.
3-5 credits. Course is restricted to students completing a one-year administrative residency. Students will examine contemporary problems and issues in the organization, administration and evaluation of health services. Focus on the application of alternative approaches to administrative problem solving. Course emphasizes internal and external stakeholder interests and factors that influence decision-making in health care organizations. Students design, conduct and present the results of a management project. Additional projects will be required for students enrolling in more than 3 credits. Graded as S/U/F.

HADM 697. Directed Research. 1-6 Hours.
Semester course; variable hours. Variable credit. Special course offered under the guidance of a faculty sponsor for one or more students to design and implement an applied research project in the field setting. Focuses on the application of research methods to policy or operational problems of health care institutions.

HADM 701. Organizational Behavior for Health Services Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADM 704 and HADM 705, or permission of instructor. Provides intellectual insights into central topics of micro organizational behavior. Requires critical evaluation of organizational behavior and health services research based on organizational behavior topics. Requires identification and application of organizational behavior theoretical perspectives to issues in the health sector.

HADM 702. Research in Health Care Financing and Delivery Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADM 701, HADM 704 and HADM 705, or permission of the instructor. Critically reviews and evaluates emerging research in organization, delivery and financing of health care services.

HADM 704. Foundations of Health Service Organization Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the roots of foundational theories and concepts in organization theory and their application to research on health care organizations and systems. Emphasizes the environment and structure of health care organizations and systems.

HADM 705. Advanced Health Service Organization Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HADM 704 or permission of instructor. Covers contemporary perspectives in health organization theory in depth, with emphasis on their research application in health care organizations. Critically assesses current examples of research on health care organizations using these perspectives.

HADM 711. Introduction to Health Services Organization Research I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open only to Ph.D. students in health services organization and research. Assists doctoral students in becoming members of the health services research community and developing skills to be successful researchers. Introduces students to health services research as a field, major databases for health services research, career paths and related ethical issues. Develops key foundational skills including database management, statistical software, grant applications and career development. First in a two-course sequence.

HADM 713. Introduction to Health Services Organization Research II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open only to Ph.D. students in health services organization and research. Assists doctoral students in becoming members of the health services organization research community and developing skills to be successful researchers. Introduces students to health services organization research as a field, major databases for health services research, career paths and related ethical issues. Develops key foundational skills including management of frequently used health services organization research databases, statistical software, grant applications and career development. Second in a two-course sequence.

HADM 760. Quantitative Analysis of Health Care Data. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MRBL 624 and HADM 609, or permission of instructor. Research course emphasizing computer application and statistical analyses of health care data generated from secondary sources, including data envelopment analysis.

HADM 761. Health Services Research Methods I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Upper-division course in statistics. Research as a systematic method for examining questions derived from related theory and/or health service practice. Major focus is on the logic of causal inference, including the formulation of testable hypotheses relating to health services organization and management, the design of methods and measures to facilitate study, and the concepts, principles and methods of epidemiology.

HADM 762. Health Services Research Methods II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADM 761 and MRBL 632, or equivalent. Application of multivariate statistical analysis and evaluation research methods to health services research. Emphasis is placed on the use of advanced statistical methods (e.g., LISREL, Event History Analysis) and designs to analyze panel data in the health field.

HADM 763. Applied Health Services Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADM 761 and ECON 501, or permission of instructor. Seminar for Ph.D. students who have had courses in quantitative analysis of health care data and research methods. Develops framework for classifying the major topics and issues addressed by health services research. Explores the relationships between health services research, policy analysis and program evaluation. Emphasizes assessment of the effectiveness, efficiency and equity of the health system at various levels of analysis. Stresses the importance of conceptual modeling as a foundation to rigorous empirical research.

HADM 792. Independent Study in Health Services Organization and Research. 1-3 Hours.
Semester course; 1-3 credits. Special study or research leading to a publication. Conducted under the guidance of a faculty sponsor.

HADM 793. Research Practicum. 1-3 Hours.
Semester course; 1-3 credits. Available only to second year students. Supervised investigation of selected problems in health services research. Includes conducting and analyzing field research.

HADM 898. Doctoral Dissertation in Health Services Organization and Research. 1-9 Hours.
Semester course; 1-9 credits. A minimum of 9 semester hours required for Ph.D. degree. Prerequisite: Completion of required course work and comprehensive examination. Dissertation research under direction of faculty adviser.

HADM 899. Doctoral Dissertation in Health Services Organization and Research. 1-9 Hours.
Semester course; 1-9 credits. A minimum of 9 semester hours required for Ph.D. degree. Prerequisite: Completion of required course work and comprehensive examination. Dissertation research under direction of faculty adviser.

Health Administration/Executive (HADE)

HADE 602. Health Systems Organization, Financing and Performance. 3 Hours.
Semester course; 3 credits. Examines the structure, functioning and financing of the U.S. health services system. Emphasizes foundational concepts for understanding and analyzing patterns of health and illness; health care cost, quality, access and utilization; workforce; competition in health care markets; and supplier, provider and payer effectiveness and efficiency.

HADE 606. Health Care Managerial Accounting. 3 Hours.
Semester course; 3 credits. Prerequisite: Permission of the instructor. A foundation course covering health care financial accounting, financial statement analysis, budgeting, reimbursement, costing and short-term decision making. Emphasizes accounting concepts and using financial data in management of providers and payers.

HADE 607. Financial Management in Health Organizations. 3 Hours.
Semester course; 3 credits. Prerequisite: HADE 606. Examines theory and techniques of managerial corporate management as applied to health service providers and insurers including time value of money, working capital management, capital budgeting techniques, cash flow analysis and capital structure planning.

HADE 609. Managerial Epidemiology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Focuses on analytical techniques to study and measure the health or populations and to evaluate programs. Topics covered include health status measurement, evaluation design and managerial applications of epidemiology.

HADE 610. Health Analytics and Decision Support. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: undergraduate course in statistics. Applications of analytics and decision support to health services institutions. Applications of operations research and industrial engineering techniques using large institutional data for health care planning, control and decision-making, including deterministic and stochastic decision analysis models and their use in health services administration.

HADE 611. Health Care Law and Bioethics. 3 Hours.
Semester course; 3 credits. Presents elements of law and legal principles as they apply to the administration of hospitals and heath care systems. Emphasizes medical malpractice, medical-legal issues, informed consent, antitrust, heath care business law and bioethics. Provides a legal foundation for the practice of health administration and clinical ethics through the use of case law and case analysis.

HADE 612. Information Systems for Health Care Management. 3 Hours.
Semester course; blended on-campus/online format. 3 credits. This course is restricted to majors only. Introduces and applies basic vocabulary, foundational principles and practical strategies associated with information systems relevant to the health care administrator. Examines health care information and information systems, technology standards and security, as well as management challenges.

HADE 614. Health Care Marketing. 3 Hours.
Semester course; 3 credits. Fundamental theories, concepts and techniques of marketing applied to the distinctive properties of health care services. Emphasizes the role of marketing and aligning organizational capacity and health care needs; market analysis and planning; strategic marketing management; tactical marketing mix design; designing and managing service delivery systems and developing new offerings.

HADE 615. Health Care Politics and Policy. 3 Hours.
Semester course; blended on-campus/online format. 3 credits. Examines the political process with particular emphasis on the impact of politics on health care. Focuses on current political issues in the health field, examining conflicts and anticipating effects on the health system.

HADE 621. Advanced Medical Informatics: Technology, Strategy and Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HADE 612 and permission of the instructor. Focuses on using technology for improving operational efficiencies, quality of care and market competitiveness. Explores various application technologies within the framework of technology-strategy-performance including: telemedicine, cyber surgery, Web-enabled clinical information systems, clinical decision support systems, artificial intelligence and expert systems, and risk-adjusted outcome assessment systems.

HADE 624. Health Economics. 3 Hours.
Semester course; 3 credits. Foundational concepts of microeconomic theory and their application in analyzing health care policy; understanding the structure and dynamics of health care markets; and monitoring and controlling the allocation of resources within health organizations.

HADE 646. Health Care Organization and Leadership. 3 Hours.
Semester course; blended on-campus/online format. 3 credits. Explores the challenges of managing and leading health care organizations in the 21st century. Introduces concepts, vocabulary and ways of thinking to enable students to be more effective and insightful participants in organizational life in health care. Intended to provide the student with the basic knowledge necessary to benefit from the more detailed and advanced courses that follow in the curriculum.

HADE 647. Management of Health Care Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HADE 646. Analyzes the current state of management study and practice with the objective of achieving a balanced development of both knowledge and skills in solving the operations problems of health institutions. Critically examines the managerial process with emphasis on leadership behavior and development, performance improvement, structure and purpose of health care organization subunits, interfunctional coordination, and organizational processes.

HADE 648. Strategic Management in Health Care Organizations. 3 Hours.
Semester course; 3 credits. Focuses on the formulation, implementation, and evaluation of strategy in health care financing/delivery organizations. Emphasizes concepts dealing with industry structure; the strategic management process; achieving and sustaining competitive advantage.

HADE 649. Human Resources Management in Health Care. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents concepts in human resources management as applied to health care organizations. Explores relationships between human resources management and general management, nature of work and human resources, compensation and benefits, personnel planning, recruitment and selection, training and development, employee appraisal and discipline, organized labor issues, and employment and labor law.

HADE 681. Special Topics in Health Administration. 1-3 Hours.
Variable hours. 1-3 credits. Investigate a specialized content area in a semester-long, seminar format. Topics may change from semester to semester.

HADE 691. Health Care Organization Diagnosis and Planning. 3 Hours.
1 credit. Provides an opportunity for students to integrate as well as apply knowledge gleaned from prior course work and to share individual experiences in assessment of and correction of organizational problems that are either operational or strategic.

HADE 692. Independent Study in Health Administration. 1-5 Hours.
Variable hours. Variable credit. Offered in all semesters for students to investigate and study topics of major interest.

Nurse Anesthesia (NRSA)

NRSA 601. Principles and Practice of Nurse Anesthesia I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces the nurse anesthesia graduate student to concepts necessary to plan and execute safe and individualized anesthetics. Covers formulation of the anesthesia care plan, anesthetic techniques, prevention of complications, fluid management, monitoring and utilization of anesthesia equipment.

NRSA 602. Principles and Practice of Nurse Anesthesia II. 3 Hours.
Semester course; 2 lecture hours. 3 credits. Second in a series of six principles and practice courses. Presents fundamental concepts and techniques essential to clinical anesthesia practice focusing on the theoretical and practical considerations involved in the administration and management of major nerve conduction anesthesia and acute pain management.

NRSA 603. Principles and Practice of Nurse Anesthesia III. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Third in a series of six principles and practice courses. Delineates techniques of anesthesia management that are considered situation specific for specialized procedures, diagnostic or individualized procedures including advanced airway management and anesthesia care individualized for the patient with cardiovascular and respiratory conditions.

NRSA 604. Principles and Practice of Nurse Anesthesia IV. 2 Hours.
Semester course; 2 semester hours. 2 credits. Fourth in a series of six principles and practice courses. Intensively covers the advanced concepts and principles of anesthetic management with an emphasis on pediatric, obstetric, endocrine and hematological disorders.

NRSA 605. Principles and Practice of Nurse Anesthesia V. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Fifth in a series of six principles and practice courses. Intensively covers the advanced concepts and principles of anesthetic management with an emphasis on neuro-anesthesia and anesthesia delivery in specialty settings.

NRSA 606. Principles and Practice of Nurse Anesthesia VI. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Last in a series of six principles and practice courses. Intensively covers the advanced concepts and principles of anesthetic management with an emphasis on crisis management.

NRSA 611. Advanced Physiological Concepts for the Nurse Anesthetist. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Analyzes complex relationships between body systems and anesthesia. Demonstrates how advanced concepts of physiology and biochemistry relate to concepts of anesthesia theory and practice.

NRSA 620. Advanced Health Assessment for Nurse Anesthetists I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides a systematic approach to advanced health assessment emphasizing best research evidence, cultural competence and anesthetic implications. Accentuates advanced pre-operative and postoperative concepts, diagnosis and approaches for the assessment of human systems in the anesthesia setting focusing on the pulmonary (upper and lower airway), hematologic and vascular systems. Reviews cardinal techniques of inspection, palpation, percussion and auscultation.

NRSA 621. Advanced Health Assessment for Nurse Anesthetists II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides a systematic approach to advanced health assessment emphasizing best research evidence, cultural competence and anesthetic implications. Accentuates advanced pre-operative and post-operative concepts, diagnosis and approaches for the assessment of human systems in the anesthesia setting focusing on the neurological, cardiovascular, gastrointestinal and musculoskeletal systems.

NRSA 622. Clinical Practicum I-II. 1 Hour.
Continuous courses; 112 clock hours (I) and 3 lecture hours (II). 1 credit (I) and 3 credits (II). Introduces clinical care with supervised participation in actual administration of anesthesia. Demonstrates internalization of theoretical concepts and techniques and application in anesthetic management toward the achievement of the terminal objectives for competency in entry-level anesthesia practice. NRSA 623 graded as S/U/F.

NRSA 623. Clinical Practicum I-II. 3 Hours.
Continuous courses; 112 clock hours (I) and 3 lecture hours (II). 1 credit (I) and 3 credits (II). Introduces clinical care with supervised participation in actual administration of anesthesia. Demonstrates internalization of theoretical concepts and techniques and application in anesthetic management toward the achievement of the terminal objectives for competency in entry-level anesthesia practice. NRSA 623 graded as S/U/F.

NRSA 624. Clinical Practicum III. 6 Hours.
675 clock hours. 6 credits. Provides intensive experience in all clinical anesthesia areas. All course work represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasis on greater responsibility for a total anesthetic regime along the educational experiential continuum.

NRSA 625. Clinical Practicum IV. 6 Hours.
675 clock hours. 6 credits. Provides intensive experience in all clinical anesthesia areas. All course work represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasis on greater responsibility for a total anesthetic regime along the educational experiential continuum.

NRSA 626. Clinical Practicum V. 6 Hours.
675 clock hours. 6 credits. Provides intensive experience in all clinical anesthesia areas. All course work represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasis on greater responsibility for a total anesthetic regime along the educational experiential continuum.

NRSA 627. Clinical Practicum VI. 6 Hours.
675 clock hours. 6 credits. Provides intensive experience in all clinical anesthesia areas. All course work represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasis on greater responsibility for a total anesthetic regime along the educational experiential continuum.

NRSA 633. Pathophysiology for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers various pathological conditions and diseases of specific concern to the anesthesia provider with an emphasis on cardiovascular, respiratory, excretory, endocrine, infectious diseases, nutritional, neuromuscular and neurological disorders.

NRSA 642. Professional Aspects of Anesthesia Practice I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides the graduate nurse anesthesia student an opportunity to focus on a variety of professional issues including but not restricted to the history of nurse anesthesia, roles of the nurse anesthetist and the American Association of Nurse Anesthetists, professional involvement, governmental and nongovernmental regulations of nurse anesthesia practice and standards of care.

NRSA 645. Professional Aspects of Anesthesia Practice II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides the graduate nurse anesthesia student an opportunity to focus on a variety of professional issues including but not restricted to health care delivery systems, assessing and selecting practice settings and employment options, medical ethics and chemical dependency.

NRSA 647. Professional Aspects of Anesthesia Practice III. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides the graduate nurse anesthesia student an opportunity to focus on a variety of professional issues including but not restricted to reimbursement, influencing health care policy, competence, quality assessment, risk management, departmental management, nurse anesthesia and the legal system, documentation of anesthesia care and current issues and their potential effects on the profession of nurse anesthesia.

NRSA 676. Teaching Methodologies for the Nurse Anesthetist. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Covers principles of teacher/learner communication, presentation strategies and methods of evaluation pertinent to nurse anesthesia education and includes instructional tools, their application and instructional design.

NRSA 683. Research Methods in Nurse Anesthesia Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Required of all nurse anesthesia students. Understands and applies the steps involved in the research process. Emphasizes concepts, procedures and processes appropriate for use in research. Develops a research proposal by exploring a topic in the area of anesthesiology. Applies inferential and advanced statistical tests to hypothetical data. Critically analyzes and evaluates anesthesia research studies.

NRSA 684. Evidence-based Decision Making in Nurse Anesthesia. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on providing a foundation in the literature relevant to nurse anesthesia practice. Emphasis placed on establishing a scientific framework for clinical interventions and critiquing the literature in a systematic fashion. Course will culminate in a broad overview of scientific foundations for nurse anesthesia practice in selected domains.

NRSA 701. Human Factors and Patient Safety for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the theoretical basis of human error, patient safety and quality assurance in anesthesia care. Introduces a systems approach to error investigation and analysis. Integrates concepts of teamwork, crisis management, simulation and monitoring systems in anesthesia practice. Crosslisted as: DNAP 701.

Nurse Anesthesia Lab (NRSZ)

NRSZ 601. Laboratory in Principles and Practice of Nurse Anesthesia I. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Provides the nurse anesthesia graduate student guided practical experience associated with those concepts presented in NRSA 601. Includes practice in and evaluation of task-specific skills in both simulated and actual operating room environments.

Nurse Anesthesia Practice (DNAP)

DNAP 701. Human Factors and Patient Safety for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the theoretical basis of human error, patient safety and quality assurance in anesthesia care. Introduces a systems approach to error investigation and analysis. Integrates concepts of teamwork, crisis management, simulation and monitoring systems in anesthesia practice. Crosslisted as: NRSA 701.

DNAP 702. Nurse Anesthesia Patient Safety Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DNAP/NRSA 701. Focuses on analysis of adverse anesthesia events from a systems perspective, use of multidisciplinary teams to solve management problems and constructive techniques for communicating with patients, families and health care providers who are involved in medical errors.

DNAP 703. Health Services Delivery Systems for the Nurse Anesthetist. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the necessary scientific foundation, both in theory and practice application, to explore the structure and function of the U.S. health care delivery system as it specifically relates to specialized nurse anesthesia practice, the components of select theories and the translation of these theories to practice.

DNAP 704. Advanced Physiology/Pathophysiology for Nurse Anesthetists I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines normal human physiology and pathophysiology using a body-systems approach, with emphasis on the interrelationships between form and function at the gross and cellular levels of organization. Includes analysis of cellular structure and function as well as the individual components of body systems.

DNAP 705. Advanced Physiology/Pathophysiology for Nurse Anesthetists II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DNAP 704. Examines normal human physiology and pathophysiology using a body-systems approach with emphasis on the interrelationships between form and function at the gross and cellular levels of organization. Includes an analysis of cellular structure and function as well as the individual components of body systems. Incorporates an overview of genetics.

DNAP 706. Advanced Pharmacology for Nurse Anesthetists I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an opportunity to focus on the advanced principles of anesthesia related to pharmacology. Presents in-depth material on the pharmacology of various classes of anesthetics and adjuvant therapeutics employed by nurse anesthetists, with an emphasis on general anesthetics.

DNAP 707. Advanced Pharmacology for Nurse Anesthetists II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DNAP 706. Provides an opportunity to focus on the advanced principles of anesthesia-related pharmacology. Includes discussions on adjuvant therapeutics employed by nurse anesthetists, with an emphasis on local anesthetics.

DNAP 711. Policy and Practice for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines governmental and non-governmental issues that influence nurse anesthesia practice. Focuses on developing skills that contribute to leadership and personal effectiveness in impletmenting change in nurse anesthesia and health care. Emphasizes interdisciplinary relationships between CRNAs, nurses, physicians, administrators, policy-makers and other key stakeholders.

DNAP 712. Leadership in Nurse Anesthesia Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines principles of teaching and learning applicable to the anesthesia didactic and clinical environment. Presents strategies in teacher/learner communication, presentation development and strategies, curriculum design and methods of evaluation pertinent to nurse anesthesia education.

DNAP 716. Advanced Chemistry and Physics Concepts for Nurse Anesthetists. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides advanced theoretical foundations of chemistry, biochemistry and physics relevant for critical application to the practice of anesthesia nursing utilizing the hybrid (blended learning) format.

DNAP 717. Advanced Physiological Concepts for Nurse Anesthetists. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Explores properties of advanced physiology including physiology terms, levels of organization of the human body, homeostasis and feedback systems, anatomic terms, planes and sections, cell physiology and diffusion, transport systems, pressure-volume relationships, pressure-flow-resistance relationships, Fick's principle, the Frank-Starling relationship, and math for physiology utilizing the hybrid (blended learning) format.

DNAP 718. Advanced Health Assessment for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a systematic, evidence-based, advanced physical, psychosocial and cultural evaluation of human systems to acquire and analyze relevant information for the development of a comprehensive patient assessment. Emphasizes advanced preoperative and postoperative techniques in a process whereby the learner translates information pertinent to anesthesia care into practice. Focuses on the symptom and health problem assessment and selection and interpretation of screening and diagnostic tests in order to implement an informed plan of care. Utilizes the hybrid (blended learning) format.

DNAP 721. Clinical Practicum I. 3 Hours.
Semester course; 300 clocked clinical hours. 3 credits. Introduces clinical care with supervised participation in actual administration of anesthesia. Demonstrates internalization of theoretical concepts and techniques and application in anesthetic management toward the achievement of the terminal objectives for competency in entry-level anesthesia practice. Graded S/U/F.

DNAP 722. Clinical Practicum II. 4 Hours.
Semester course; 400 clocked clinical hours. 4 credits. Prerequisite: DNAP 721. Introduces clinical care with supervised participation in actual administration of anesthesia. Demonstrates internalization of theoretical concepts and techniques and application in anesthetic management toward the achievement of the terminal objectives for competency in entry-level anesthesia practice. Graded S/U/F.

DNAP 723. Clinical Practicum III. 5 Hours.
Semester course; 500 clocked hours. 5 credits. Prerequisite: DNAP 722. Provides intensive experience in all clinical anesthesia areas. Represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasizes increased responsibility for the delivery of a comprehensive anesthetic regime along the educational/experiential continuum. Graded S/U/F.

DNAP 724. Clinical Practicum IV. 5 Hours.
Semester course; 500 clocked clinical hours. 5 credits. Prerequisite: DNAP 723. Provides intensive experience in all clinical anesthesia areas. Represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasizes increased responsibility for the delivery of a comprehensive anesthetic regime along the educational/experiential continuum. Graded S/U/F.

DNAP 725. Clinical Practicum V. 5 Hours.
Semester course; 500 clocked clinical hours. 5 credits. Prerequisite: DNAP 724. Provides intensive experience in all clinical anesthesia areas. Represents an integral phase of sequenced clinical progress toward the achievement of competency in entry-level anesthesia practice. Includes clinical rotations to various affiliate sites to gain experience in management of specialized anesthetic considerations. Emphasizes increased responsibility for the delivery of a comprehensive anesthetic regime along the educational/experiential continuum. Graded S/U/F.

DNAP 731. Professional Aspects of Nurse Anesthesia Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an opportunity to focus on a variety of professional issues including but not restricted to the history of nurse anesthesia, professional practice roles, settings and responsibilities of the nurse anesthetist, effective communications, accountability and patient advocacy, cultural competency, professional involvement, code of ethics, regulations, and standards of practice using a hybrid (blended learning) format.

DNAP 733. Evidence-based Decision-making in Nurse Anesthesia. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a foundation of literature relevant to nurse anesthesia practice. Emphasizes a systematic framework that is termed "evidence-based practice" for clinical interventions and critiquing the literature in an appropriate and manageable fashion. Culminates in a broad overview of scientific foundations for nurse anesthesia practice in selected domains. Utilizes the hybrid (blended learning) format.

DNAP 734. Research Methods and Statistical Measures in Nurse Anesthesia Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines relationships among theory, research and causal inference; quantitative and qualitative methodologies will be considered. Surveys issues relevant to research design, measurement, data collection, statistical analysis, interpretation and ethical issues in conducting research — and grounded in work in the domain of anesthesia and critical care. Prepares students to access, critically evaluate and utilize research-based literature and independently initiate a systematic approach to addressing a research hypothesis or research question. Utilizes a hybrid (blended learning) format.

DNAP 735. Principles and Practice of Nurse Anesthesia Practice I. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Introduces the nurse anesthesia student to concepts necessary to plan and execute safe and individualized anesthetics. Covers formulation of the anesthesia care plan, anesthetic techniques, prevention of complications, fluid management, monitoring and utilization of anesthesia equipment. Provides guided practical experience associated with course concepts, including practice with and evaluation of task-specific skills in both simulated and actual operating room environments.

DNAP 736. Principles and Practice of Nurse Anesthesia II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DNAP 735. Delineates techniques of anesthesia management that are considered situation-specific for specialized procedures, diagnostic or individualized procedures, including advanced airway management and anesthesia care individualized for the patient with cardiovascular or respiratory conditions.

DNAP 737. Principles and Practice of Nurse Anesthesia III. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DNAP 736. Presents fundamental concepts and techniques essential to clinical anesthesia practice focusing on the theoretical and practical considerations involved in the administration and management of regional anesthesia and pain management.

DNAP 738. Principles and Practice of Nurse Anesthesia IV. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: DNAP 737. Covers the advanced concepts and principles of anesthetic management in obstetrics, pediatrics, hematologic disorders and endocrine disorders.

DNAP 739. Principles and Practice of Nurse Anesthesia V. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: DNAP 738. Covers the advanced concepts and principles of anesthetic management including anesthesia delivery in specialty settings and other specialty topics.

DNAP 789. Nurse Anesthesia Professional Practice. 1-6 Hours.
Semester course; variable clinical hours. 1-6 credits (100 clinical hours per credit). May be repeated up to six credits. Emphasizes analysis and evaluation of experiential learning through the use of critical thinking skills and reflection. Explores concepts of competency and expertise. Focuses on methods of determining best anesthesia practices through identification of problems, review and systematic evaluation of current research, and consideration of economic and other factors that may impact patient outcomes. Graded as S, U or F.

DNAP 799. Nurse Anesthesia Capstone Project. 1-6 Hours.
Semester course; variable hours. 1-6 credits. May be repeated up to six credits. Prerequisites: DNAP 701 and ALHP 708. Focuses on identification of relevant clinical issues in anesthesiology with attendant formulation of critically applicable questions and examination of the relevant research evidence that addresses those questions. Students implement and evaluate a terminal project and disseminate the results through an oral and/or poster presentation, manuscript submission to a peer-reviewed journal or another appropriate medium. Graded as S, U or F.

Occupational Therapy (OCCT)

OCCT 520. Occupational Therapy Applications: Kinesiology. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Addresses basic components of motion, biomechanics, joint structure, specific muscle groups and muscle function. Analyzes functional activities necessary to carry out the tasks and roles of productive living using these principles.

OCCT 521. Neuroscience Applications to Occupational Therapy. 3 Hours.
Semester course; 2 lecture hours. 2 lab hours, 3 credit hours. Links basic structure and organization of nervous system to function in typical individuals. Examines neuroscience correlates of diseases and disabilities. Relies on current review of neuroscience literature in matching function and dysfunction with structure and organization. Case examples across the life span used to understand these potential relationships and link material to OT theories and frames of reference guiding practice.

OCCT 522. Interdisciplinary Medical Lectures. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents information on medical conditions commonly seen by occupational therapists, providing diagnostic features, associated conditions, prevalence and course for each. Addresses value and limitations of this knowledge to occupational therapy process, and need for therapists to search out information about other conditions. Introduces medical terminology and therapeutic uses, side effects and precautions of medication. Describes occupational therapy interventions and clinical pathways for certain impairments.

OCCT 530. Nature of Occupational Therapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Provides an overview of fundamentals of occupational therapy through use of official documents of the American Occupational Therapy Association and other authoritative sources. Introduces practice definitions, philosophical and ethical underpinnings, professional roles, and organizations in the field of occupational therapy.

OCCT 531. Interpersonal Communication and Group Dynamics. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Introduces oral and written communication skills and group process techniques. Addresses interpersonal relationships, principles of therapeutic involvement, observation, analysis of communication patterns, interview methods and OT terminology. Provides experiences in group leadership, assertiveness techniques. Laboratory exercises chart path of personal development, professional socialization.

OCCT 532. Life Span Occupational Development. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Explores principles and theories of normal growth and development and their influence on occupational performance across the life span. Presents all domains of development and life span roles. Focuses on work/productivity, leisure/play and activities for daily living. Explores importance of significant others and environment, maintaining balance between performance areas and fulfilling expected and desired social roles. Stresses influence of temporal and environmental contexts.

OCCT 533. Occupational Therapy Principles, Values and Theories. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Examines theoretical constructs used in various models of occupational therapy practice along with legislation, advocacy and empowerment using an historical framework. Addresses influence of legislation relevant to clients and the profession, their dynamic impact on practice patterns and advocacy issues. Emphasizes concepts integral to understanding and using human occupation as a basis for practice as well as the dynamic relationship among occupational therapy principles, values and theories.

OCCT 534. Occupational Therapy Evaluation and Intervention Overview. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Provides an introduction to evaluation and the intervention process as it relates to performance components, areas and contexts. Focuses on general evaluation of assessments for various treatment settings and environments. Emphasis on use of assessment data to determine appropriate treatment intervention and discharge planning for individuals. Verbal communications and written documentation will be covered.

OCCT 580. Introduction to the Profession of Occupational Therapy. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Provides an overview of fundamentals of occupational therapy through use of the Official Documents of the American Occupational Therapy Association and other authoritative sources. Introduces practice definitions, philosophical and ethical underpinnings, professional roles and organizations, and the clinical reasoning process, as well as characteristics and values recommended for successful performance as a professional occupational therapist.

OCCT 589. Advanced Functional Anatomy. 5 Hours.
Semester course; 2 lecture and 6 laboratory hours. 5 credits. Taught as an intensive six-week course with one lecture and three lab hours, five days a week. Addresses the anatomy of the human body relevant to occupational therapy practice including, but not limited to, the skeletal system, muscle tissue and the muscular system, and the cardiovascular system. Anatomical/medical terminology including anatomical planes, anatomical position, abbreviation of terms and terms of movement are covered.

OCCT 590. Functional Movement Analysis in Occupational Therapy. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: OCCT 589. Addresses kinesiology and functional anatomy including the basic components of palpation, joint structure and the study of kinematics, specific muscle groups and muscle function. Functional activities necessary to carry out the tasks and roles of productive living are analyzed and emphasized using these principles.

OCCT 591. Neuroscience Applications to Occupational Therapy. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Lab focuses on structures, basic function and inter-relationships; lecture addresses structure-function relationships, system organization and structure relationships, and higher order functions in the typical nervous system. Case examples across the lifespan will link function with dysfunction, and application to injury, disorder, disease processes common to occupational therapy practice. Course relies on a current review of neuroscience literature in matching function and dysfunction with structure and organization.

OCCT 592. Introduction to Injury, Illness and Disability. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents information on medical conditions commonly seen by occupational therapists, providing diagnostic features, associated conditions, prevalence and course of disease for each. Addresses value and limitations of this knowledge to the occupational therapy process and need for therapists to search out information about other conditions. Introduces medical terminology and therapeutic uses, side effects, and precautions of medication. Describes occupational therapy interventions for certain impairments.

OCCT 593. Analysis of Human Occupation. 1 Hour.
Semester course; 2 laboratory hours. 1 credit. Prerequisite: OCCT 580. Explores activities and occupation and related professional terminology, activity analysis and therapy as a teaching/learning process. Emphasizes analysis of occupational performance skills and the transaction between client factors, activity demands and context.

OCCT 594. Theoretical Foundations of Occupational Therapy. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: OCCT 580. Examines theoretical constructs underlying occupational therapy practice. Uses a historical framework to critically examine the ideas put forth by earlier frames of reference and current conceptual models of practice. Emphasizes concepts integral to the understanding and use of human occupation as a basis for practice as well as the dynamic relationships among occupational therapy principles, values and theories.

OCCT 613. Adult Occupational Performance I. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: OCCT 592. Examines adult evaluation and treatment fundamentals that support occupational performance interventions. Covers evaluation and treatment content underlying and applicable to all areas of occupational performance. Includes specific assessments, practical information on understanding clients with a variety of conditions and therapist skills.

OCCT 614. Pediatric Occupational Performance I. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Prerequisite: OCCT 522. Focuses on occupational performance of young children (infants, toddlers and preschoolers) with disabilities. Explores principles and theories of normal development as a baseline for identifying the impact of illness, injury or environmental factors on occupational engagement. Examines a variety of frames of reference, evaluative and intervention approaches for children and their families in medical, home, community and educational settings. Uses a holistic approach to develop a child's abilities to engage in their occupations while meeting expectations of family and environment.

OCCT 615. Level I Fieldwork in Occupational Therapy. 1 Hour.
Semester course; 54 clinical hours. 1 credit. Enriches classroom learning by providing directed observation and participation in clinical practice settings. Provides experiences supervised by professionals working in one of a variety of clinical settings (e.g., early intervention, schools, hospitals, nursing homes, home health agencies or mental health settings). Arranges placements to complement the treatment intervention courses. Prepares students for the more complex level II fieldwork clinical experience.

OCCT 616. Research Process in Occupational Therapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers basic steps in research process, including problem definition, literature review, design, data collection and analysis, and dissemination of findings. Addresses qualitative and quantitative research approaches, critical analysis of literature and reviews statistical concepts.

OCCT 617. Therapeutic Process in Occupational Therapy. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Focuses on essential knowledge of therapeutic use of self, group process techniques, interview methods, therapist interaction skills, assessment of process and social interaction occupational performance skills, and individual and group intervention applicable to core and specialty psychosocial practice with youth and adults in support of participation in occupation.

OCCT 620. Occupational Therapy Practice Activities I: Activity Analysis. 1 Hour.
Semester course; 2 laboratory hours. 1 credit. Explores activities and occupation and related professional terminology, activity analysis, and therapy as a teaching/learning process. Emphasizes analysis of occupational performance skills and the transaction between client factors, activity demands and context.

OCCT 621. Occupational Therapy Practice Activities II: Assistive Technologies. 1 Hour.
Semester course; 2 laboratory hours. 1 credit. Focuses on the evaluation, activity analysis and intervention process with a range of assistive technology, including software, hardware and low-tech solutions. Includes the development of skills for adaptation of activities and contexts.

OCCT 623. Occupational Therapy Practice Activities III: Activity and Occupational Synthesis. 1 Hour.
Semester course; 2 laboratory hours. 1 credit. Emphasizes altering, adapting and modifying activities and contexts to increase occupational performance. Includes experiential learning in the community and exposure to adapted leisure activities.

OCCT 630. Adult Evaluation and Intervention I: Foundations. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Examines adult evaluation and treatment fundamentals that support occupational performance interventions. Covers evaluations and treatment content underlying and applicable to all areas of occupational performance. Includes specific assessments, practical information on understanding clients with a variety of conditions and therapist skills.

OCCT 633. Adult Evaluation and Intervention II: Facilitating Function With Disability Across the Continuum of Care. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Introduces students to assessment and intervention strategies, tools and equipment typically used in adult physical disability settings across the continuum of care. Focuses on occupational performance while considering client factors, tasks and context. Draws on practical experience and application of materials taught in previous adult physical disability course work. Working with the instructor, clinical faculty and people with disabilities in laboratory and lecture sessions, utilizes clinical reasoning skills, technologies and strategies typically employed to treat a variety of adult functional disability conditions across the continuum of care, including ADL, IADL, community living vocational training, play and leisure.

OCCT 635. Psychosocial Evaluation and Intervention I: Foundations. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Examines fundamental knowledge of adolescent and adult psychosocial evaluation and intervention to support adaptation and participation in occupation. Includes core and specialty practice psychosocial knowledge, information on stigma and stereotyping, therapist skills, specific assessments and interventions, and leadership of a community-based group intervention.

OCCT 636. Fieldwork I in Psychosocial Occupational Therapy. 2 Hours.
Semester course; 1.5 lecture and .5 clinical hours. 2 credits. Focuses on occupational performance of adolescents and adults with psychosocial dysfunction. Provides service-learning fieldwork I experiences applying clinical reasoning, and conceptual practice models to plan, implement and evaluate evidence-based intervention in community-based mental health settings. Preliminary step to the more complex level II fieldwork experience.

OCCT 640. Pediatric Evaluation and Intervention I: Infant and Preschool Children. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Focuses on occupational performance of infants, toddlers and preschoolers with disabilities. Explores a variety of frames of reference and evaluative and intervention approaches for children and their families in medical, home, community and educational settings. Uses a holistic approach to develop child's abilities to play/perform basic ADLs while meeting expectations of family and environment.

OCCT 641. Pediatric Evaluation and Intervention II: Ages 6 to 12. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Focuses on occupational performance of children with disabilities ages six through adolescence. Explores a variety of frames of reference, evaluative and intervention approaches for children, their families in multiple practice arenas emphasizing the child's performance in educational settings. Uses a holistic approach to develop child's competence in school, activities of daily living, play, work and community while meeting expectations of family and environment. Includes field-based experiences.

OCCT 650. Occupational Therapy in Health Care. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces contemporary issues, trends in occupational therapy health-care settings. Covers principles of managed care and impact on occupational therapy practice. Focuses on changes in practice sites, service delivery models and patient demographics. Emphasizes how occupational therapists can influence health policy, advocate for change and address emerging professional ethical issues. Encourages consideration of integrating holistic/biopsychosocial nature of occupational therapy into biomedical health-care systems.

OCCT 651. Administration and Supervision of Occupational Therapy Services. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Covers management of human and non-human resources to provide efficient and effective occupational therapy services; nature of formal and informal organizations, administrative process and administrative tasks. Includes supervision, consultation and the planning of occupational therapy fieldwork education.

OCCT 654. Children and Young Adult Advanced Assistive Technology Applications in Occupational Therapy. 3 Hours.
Semester course; 3 credits. Provides an in-depth view of assistive technology and human-environment/technology interface for children and young adults. Focuses on the use of AT in occupational therapy evaluation and intervention. Exposes students to tools and strategies for integrating computer hardware and software, augmentative communication devices, ECUs, powered mobility, toys and low technology solutions into home, school, recreation, community and work environments. Requires student problem-solving relative to their area of pediatric or young adult research and clinical practice.

OCCT 655. Older Adult Advanced Assistive Technology Application in Occupational Therapy. 3 Hours.
Semester course; 3 credits. Provides an in-depth view of assistive technology and human-environment/technology interface for older adults with disabilities. Focuses on use of assistive technology in occupational therapy evaluation and intervention. Exposes occupational therapy students to tools and strategies for integrating environmental control units, powered mobility, computer hardware and software, augmentative communication devices, low vision, hearing impaired and low technology solutions into the lives of elderly assistive technology consumers. Requires students to problem solve within their area of gerontology research and clinical practice.

OCCT 656. Advanced Neuroscience Applications in Occupational Therapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Requires instructor's permission for non-occupational therapy majors. Briefly reviews basic structure and organization of nervous system in typical individuals. Emphasizes student examination of current neuroscience literature relative to diseases and disabilities encountered in clinical practice, matching function and dysfunction with structure and organization. Students explore individual topics of interest; present to other professionals. Addresses specific cases from participants' clinical and professional experience, and links this to contemporary OT theories and frames of reference guiding practice.

OCCT 660. Level I Fieldwork in Occupational Therapy. 1 Hour.
Semester course; 45 clinical/seminar hours. 1 credit. Enriches classroom learning by providing directed observation and participation in clinical practice settings. Provides experiences supervised by professionals working in one of a variety of clinical settings (e.g., early intervention, schools, hospitals, nursing homes, home health agencies or mental health settings). Placements arranged to complement the treatment/intervention courses. A preliminary step to the more complex Level II Fieldwork clinical experience.

OCCT 661. Occupational Therapy in the Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Registration open to other professional students with permission of the instructor. Studies the roles and functions of occupational therapists in school settings as defined by the educational model, government regulations and service provision patterns. Emphasizes person-centered planning, parent and professional collaboration and educationally relevant approaches. Integrates the use of research and clinical reasoning to provide occupation-based practice for students with disabilities of all ages.

OCCT 662. Neuroscience Review and Sensory Integration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Reviews neuroscience basics related to function and dysfunction. Overviews brain structures and function on both gross and cellular levels. Examination of the sensory integration neuroscience theory base which provides foundation for additional study of brain structure as it relates to function and dysfunction. Links understanding of neuroscience with occupation and occupational performance.

OCCT 663. Beyond the Basics: Advanced Evaluation and Intervention in Pediatric Occupational Therapy. 3 Hours.
Semester course; 3 credits. Restricted to post-professional master's level students. Provides in-depth view of selected occupational therapy assessment and intervention techniques for children and youth with disabilities. Exposes students to practical tools and strategies for integrating treatment into home, school, recreation, community and work environments. Requires students to investigate their own clinical reasoning skills relative to their area of pediatric interest, clinical practice and research. Specifically focuses on use of sensory integration theory and practice for infants and children, issues related to feeding and play, and the transition of adolescents with disabilities into postsecondary, work and community environments.

OCCT 670. Case-based Clinical Reasoning in Occupational Therapy. 2 Hours.
Semester course; 4 laboratory hours. 2 credits. Utilizes case studies to develop clinical reasoning skills and examine evaluation and treatment alternatives for persons with occupational performance limitations. Focuses on life-span development issues. Uses cases designed to integrate and develop strategies based on previously presented material. Incorporates assistive technology as an intervention tool into the case-based learning process. Graded as Pass/Fail.

OCCT 671. Advanced Theory in Occupational Therapy. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be repeated for a maximum of 4 credits. Integrates examination of historical and current theoretical constructs reflected in professional literature and published conceptual models of practice with the clinical expertise of experienced occupational therapists. Examines the clinical reasoning process and fosters high-level theoretical and clinical thinking. Builds upon entry-level study of theory to emphasize dynamic relationship between theory, clinical reasoning and client-based and occupation-based practice.

OCCT 673. Health Care Delivery and Occupational Therapy Practice Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to post-professional master's level students. Introduces contemporary issues and trends in occupational therapy health-care settings. Covers principles of managed care and impact on occupational therapy practice. Focuses on changes in practice sites, service delivery models and patient demographics. Emphasizes on how occupational therapy influences health policy, advocates change and addresses emerging professional and ethical issues. Encourages consideration of integrating holistic/biopsychosocial nature of occupational therapy into biomedically oriented health-care system.

OCCT 680. Level II Fieldwork in Occupational Therapy: A. 1-9 Hours.
Semester course; students must complete 480 clinical hours. Variable credit. Maximum of 9 credits per semester. Clinical experience must be different from that offered in OCCT 681. Expands experience in delivering occupational therapy services to a variety of individuals across the lifespan and in a variety of settings. Promotes interpretation of previously learned skills and knowledge through clinical reasoning and reflective practice. Extends skills of professionalism and competence as entry-level occupational therapists. Graded as P/F or PR.

OCCT 681. Level II Fieldwork in Occupational Therapy: B. 1-9 Hours.
Semester course; students must complete 480 clinical hours. Variable credit. Maximum of 9 credits per semester. Clinical experience must be different from that offered in OCCT 680. Expands experience in delivering occupational therapy services to a variety of individuals across the lifespan and in a variety of settings. Promotes interpretation of previously learned skills and knowledge through clinical reasoning and reflective practice. Extends skills of professionalism and competence as entry-level occupational therapists. Graded as P/F or PR.

OCCT 685. Advanced Clinical Reasoning: Asking the Right Questions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides foundation and understanding of the source of clinical reasoning as a basis of clinical practice in occupational therapy through case-based learning. Promotes clinical reasoning within the practice of occupational therapy, bridging practice theories, evidence-based practice and clinical skills. Requires examination of existing knowledge and data, and development of a clinical project proposal.

OCCT 686. Advanced Clinical Reasoning Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OCCT 685 Forms the application component of clinical reasoning process; offers opportunity to experience clinically based project implementation within the context of ongoing practice. Facilitates mentoring relationships with colleagues in an identified specialty area to promote leadership in clinical reasoning. Implements project proposals developed in OCCT 685; data will be collected, interpreted and summarized.

OCCT 689. Occupational Therapy Assessment and Evaluation. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: OCCT 592. Provides introduction to evaluation and intervention process as it relates to areas of occupation, occupational performance skills (i.e., motor, process and social interaction), client factors and context. Focuses on general evaluation of assessments for various clients, treatment settings and environments. Emphasizes oral and written communication, accurate documentation and use of assessment data to develop appropriate treatment intervention and discharge planning for individuals.

OCCT 690. Occupational Therapy Seminar. 1-3 Hours.
Variable hours. 1-3 credits. May be repeated for a maximum of 4 credits. Investigation, presentation and discussion of current problems and issues in the field of occupational therapy.

OCCT 691. Special Topics in Occupational Therapy. 1-3 Hours.
Semester course; 1-3 credits. Designed around the interests of students, faculty expertise, and availability and expertise of Richmond-area occupational therapists or visiting lecturers. Format may include intensive mini-courses or workshops, an advanced course with some opportunity for election and development of knowledge and skills in a specialized area of occupational therapy.

OCCT 692. Assistive Technologies for Occupational Engagement. 2 Hours.
Semester course; 4 laboratory hours. 2 credits. Prerequisite: OCCT 593. Focuses on the evaluation, activity analysis and intervention process with a range of assistive technology, including software, hardware and low-tech solutions. Includes the development of skills for adaptation of activities and contexts.

OCCT 693. Occupational Synthesis and Adaptations. 2 Hours.
Semester course; 1 lecture 2 lab hours. 2 credits. Prerequisites: OCCT 593 and 692. Builds upon activity analysis skills. Emphasizes altering, adapting and modifying activities and contexts to promote increased occupational performance. Includes development of planning and construction skills, experiential learning and exposure to adapted leisure activities in the community, and design and production of an adaptive project for an individual with a disability, therapist or facility.

OCCT 695. Fieldwork: Specialty (Optional). 1-9 Hours.
Twelve weeks full-time experience in programs providing occupational therapy services. 1-9 credits. Minimum total required for all fieldwork courses is 18 semester hours. Determination of the amount of credit and permission of the instructor and department chair must be secured prior to registration for the course. Supervised fieldwork experiences are arranged in various settings for the application of academically acquired knowledge. Placements include experiences in prevention, health maintenance, remediation, daily life tasks and vocational adjustment. Fieldwork settings may include hospitals, rehabilitation centers, school systems, community agencies, camping programs, penal systems and the like. Fieldwork experiences are arranged individually, but placement in a specified location cannot be guaranteed. In the event of failure, the course may be repeated only upon recommendation by the academic and clinical faculty. Fieldwork must be completed no later than 24 months following completion of the academic phase.

OCCT 697. Independent Study. 1-3 Hours.
1-3 credits. The student will submit a proposal for investigating some area or problem in occupational therapy not ordinarily included in the regular curriculum. The student's desired study must be described in a contract written by the student and approved by the faculty member. The results of the study will be presented in a written or oral report.

OCCT 698. Research in Occupational Therapy. 1-3 Hours.
Semester course; 1-3 credits. Completion of a proposal for a research project relevant to occupational therapy.

OCCT 700. Enabling Occupational Performance: The Canadian Perspective. 3 Hours.
International study course; 2 lecture and 2 laboratory hours. 3 credits. Introduces guiding principles for enabling occupation within a Canadian context. Examines client-centered practice from perspective of Canandian occupational therapists and publications by the Canadian Association of Occupational Therapists. Focuses on theory and implementation. Characteristics of components of the Canadian Occupational Performance Moded will be examined as determinants of health, well-being and participation of individuals, groups and communities. Examines issues pertaining to Canadian society, culture and history, trends that have affected the Canadian health and social services system, and comparisons between Canadian and American systems. Course takes place in summer semester in London, Ontario, Canada.

OCCT 709. Research Process and Statistical Analysis in Occupational Therapy. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Restricted to entry-level master's students. Prepares students to write research proposal for completion of the requirements of the master's degree. Covers basic steps in research process, including problem definition, literature review, design, data collection and analysis, and dissemination of findings. Students will demonstrate understanding of statistical analysis after completing a review of introductory statistical concepts. Addresses quantitative and qualitative approaches. Students will review and critically analyze literature in preparation for subsequent research experiences.

OCCT 710. Quantitative Research Processes. 3-4 Hours.
Semester course; 3-4 lecture hours. 3-4 credits. Prepares students as critical consumers of research. Provides overview to basic steps in research process, including problem definition, literature review, design, data collection and data dissemination. Students critically analyze each step and compare across different examples. Discussion of strengths and weaknesses in all areas of research. Focus on quantitative approaches with general introduction to basics of qualitative research for comparison.

OCCT 711. Research Process in Occupational Therapy: Qualitative Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces qualitative methods of research with goals of understanding the theoretical underpinnings, gaining practical experience and developing an understanding of the "self" as an instrument. Focuses on qualitative methods in occupational therapy research and their application to practice.

OCCT 713. Adult Occupational Performance II. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Prerequisite: OCCT 613. Expands the depth and breadth of content introduced in prerequisite course. Analyzes assessment and intervention strategies, tools and equipment typically used in adult occupational therapy settings across the continuum of care. Examines evaluation and treatment of functional disability for adults in clinical and natural environments. Focuses on occupational performance, while considering client factors, tasks and context. Stresses application of knowledge of clinical reasoning, theoretical practice models and cultural and contextual issues in evaluating and planning treatment.

OCCT 714. Pediatric Occupational Performance II. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Prerequisite: OCCT 614. Focuses on occupational performance of children with disabilities ages 6 through adolescence. Explores a variety of frames of reference and evaluative and intervention approaches for children and their families in multiple practice arenas, emphasizing the child's performance in educational settings. Uses a holistic approach to develop the child's competence in school, activities of daily living, play, work and community while meeting expectations of family and environment. Includes field-based experiences.

OCCT 715. Level I Fieldwork in Occupational Therapy. 1 Hour.
Semester course; 54 clinical hours. 1 credit. Enriches classroom learning by providing directed observation and participation in clinical practice settings. Provides experiences supervised by professionals working in one of a variety of clinical settings (e.g., early intervention, schools, hospitals, nursing homes, home health agencies or mental health settings). Arranges placements to complement the treatment intervention courses. Prepares students for the more complex level II fieldwork clinical experience.

OCCT 716. Evidence-based Practice in Occupational Therapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines one of the roots of clinical practice: the existence of evidence. Provides an overview of evidence-based practice in general, and more specifically, in occupational therapy. Emphasizes in-depth information on levels of evidence, developing practice questions and understanding available resources. Analyzing existing evidence is included. Addresses clinical application and resources for further study. Emphasizes practical application of EBP concepts to OT, laying groundwork for best practice.

OCCT 717. Level I Fieldwork in Psychosocial Occupational Therapy. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: OCCT 617. Focuses on occupational performance of adolescents and adults with psychosocial dysfunction. Provides service learning level I fieldwork experiences to apply knowledge of clinical reasoning and conceptual practice models to plan, implement and evaluate evidence-based group intervention in community-based mental health settings. Prepares students for the more complex level II fieldwork clinical experience.

OCCT 720. Policy, Advocacy and Management for Occupational Therapy Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Addresses the principles and application of leadership and management skills within the context of occupational therapy services, federal and state legislation and regulations, national requirements, and the various contexts of service delivery. Focuses on knowledge and skills for the management of human and nonhuman resources for efficient and effective occupational therapy services. Evaluates contemporary policy issues, including trends in occupational therapy settings. Covers principles of reimbursement systems with analysis on the impact on occupational therapy practice. Focuses on changes in practice sites, service delivery models and patient demographics. Emphasizes how occupational therapists can influence policy, advocate for change and address emerging professional ethical issues. Encourages consideration of integrating holistic/biopsychosocial nature of occupational therapy into biomedical health care systems.

OCCT 721. Clinical Reasoning in Occupational Therapy. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisites: OCCT 617, OCCT 713, OCCT 714. Utilizes case studies to develop clinical reasoning skills and examine evaluation and treatment alternatives for persons with occupational performance limitations. Focuses on lifespan development issues. Uses cases designed to integrate and develop strategies based on previously presented material.

OCCT 729. Research Practicum. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Supervised investigation of selected problems in occupational therapy. Exposes students to varied tasks integral to research implementation. Addresses overall research design and implementation process and skills needed for publication and presentation of research. Students complete an individualized learning contract. Graded as "S," "U" or "F.

OCCT 735. Evidence Bases for Occupational Therapy Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines one of the roots of clinical practice: the existence of evidence. Provides an overview of evidence-based practice (EBP) in general and, more specifically, in occupational therapy. Provides in-depth information on levels of evidence; developing practice questions, understanding available resources and analyzing existing evidence is included. Ties in with clinical reasoning skills, extending them to understanding the literature. Clinical application and resources for further study will be addressed. Emphasis on practical application of EBP concepts to OT, laying groundwork for best practice.

OCCT 736. Developing Fundable Projects. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the environment and opportunities for seeking and obtaining external funding in the area of health-related sciences. Will address proposals for program development and evaluation, training and research. Studies components of typical proposals and supports proposal development by student. Analyzes and critiques student proposals using both peer and instructor review. Discusses relationships between proposal writing and leadership skills and knowledge.

OCCT 739. Program Development and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores basic program development, program evaluation and needs-assessment methods necessary for developing upcoming capstone leadership projects. Focuses on conceptualization, design, models and approaches, and operational procedures used in program development and evaluation. Presents the planning and evaluation cycle, categories of evaluation, program development models and needs-assessment techniques used in creating programs. Explores ideas for program development from a variety of perspectives, including potential for evaluation of processes and outcomes, social and clinical indicators of need, asset mapping, and potential impact of the program. Emphasizes the roles of key stakeholders, regulatory bodies and evaluators, development and use of program theory, and dissemination of evaluation results for improvement of programs and policies.

OCCT 740. Concepts in Disability Leadership for Occupational Therapists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides basic descriptions of leadership and innovation, especially as they apply to the disability community, and presents theoretical concepts of organizational leadership. Presents concepts of change in organizational, community, political and social action/social movement contexts. This is the first of a series of three courses on leadership in disability for occupational therapists.

OCCT 741. Disability Leadership Applications for Occupational Therapists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Fosters development of skills needed to assume leadership roles in disability-related areas of practice by creating detailed proposals for the practicum in disability leadership for occupational therapists, to be implemented in the third course in the series. Students increase understanding of leadership concepts by conducting needs assessments and collecting other pilot data in community settings that provide services for people with disabilities. The second of a series of three courses on leadership in disability for occupational therapists, course focuses on application of theoretical concepts learned in the first leadership course.

OCCT 742. Practicum in Leadership for Occupational Therapists. 4 Hours.
Semester course; 1 lecture and 3 laboratory hours. 4 credits. Builds leadership skills in occupational therapists for work in health care, education and disability-focused organizations. Emphasizes relationships with other professionals, governing boards, regulatory bodies and other key stakeholders through an identified and pre-approved leadership project. Promotes exploration of personal styles of leadership. Serves as applied practicum course in leadership development.

OCCT 743. Synthesis and Evaluation of Capstone Leadership Project. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Culminating course in the four-part leadership series. Focuses on synthesis and evaluation of capstone leadership project. Leads to assessment and critique of project implementation through compilation and analysis of project results. Re-examines leadership theories, personal leadership styles and their relationship to program outcomes. Proposes and critiques resources for project sustainability, clinical application and dissemination. Requires written and verbal presentation of final project and assessment of its value to the health care community.

OCCT 759. Fieldwork Education Seminar. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: OCCT 715. Promotes professional formation through the integration of foundation concepts and skills necessary for succeeding in fieldwork II and professional practice. Emphasizes policies and procedures, self-awareness and growth, and supervision and communication skills. Extends skills of professionalism and preparation for level II fieldwork experiences.

OCCT 760. Level II Fieldwork in Occupational Therapy. 1-9 Hours.
Semester course; variable hours (54 clinical hours/credit). 1-9 credits, Prerequisites: IPEC 501, OCCT 580, OCCT 589, OCCT 590, OCCT 591, OCCT 592, OCCT 593, OCCT 594, OCCT 613, OCCT 614, OCCT 615, OCCT 616, OCCT 617, OCCT 689, OCCT 693, OCCT 713, OCCT 714, OCCT 715, OCCT 716, OCCT 717, OCCT 720, OCCT 721, OCCT 759, OCCT 752, OCCT 780, OCCT 781. Expands experience in delivering occupational therapy services to variety of individuals across the lifespan in a variety of settings. Promotes interpretation of previously learned skills and knowledge through clinical reasoning and reflective practice. Students extend skills of professionalism and competence as entry-level occupational therapists. Students must complete 480 clinical hours of OCCT 760.

OCCT 761. Level II Fieldwork in Occupational Therapy. 1-9 Hours.
Semester course; variable hours (54 clinical hours/credit). 1-9 credits, Prerequisite: OCCT 760. Clinical experience must be different from that offered in OCCT 760. Expands experience in delivering occupational therapy services to variety of individuals across the lifespan in a variety of settings. Promotes interpretation of previously learned skills and knowledge through clinical reasoning and reflective practice. Students extend skills of professionalism and competence as entry-level occupational therapists. Students must complete 480 clinical hours of OCCT 761.

OCCT 780. OTD Leadership Seminar. 2 Hours.
Seminar course; 2 lecture hours. 2 credits. A six-week intensive course that focuses on exploration of special topics integral to advancement of occupational therapy practice including, but not limited to, principles of leadership theory, research, emerging practice areas, teaching and learning, and advanced theory.

OCCT 781. Program Development and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Six-week intensive course. Prerequisite: OCCT 616. Explores basic program development, program evaluation and needs assessment methods necessary for developing upcoming leadership-based doctoral practicum. Focuses on conceptualization, design, models and approaches, and operational procedures used in program development and evaluation. Presents the planning and evaluation cycle, categories of evaluation, program development models and needs assessment techniques used in creating programs. Explores ideas for program development from a variety of perspectives including potential for evaluation of processes and outcomes, social and clinical indicators of need, asset mapping and potential impact of the program. Emphasizes the roles of key stakeholders, regulatory bodies and evaluators, development and use of program theory, and dissemination of evaluation results for improvement of programs and policies.

OCCT 782. Professional Development Portfolio. 2 Hours.
Seminar course; 3 lecture hours. 3 credits. Prerequisites: OCCT 780, OCCT 781. Requires development of independent proposal for professional development based on selection of leadership topic of interest. Guided by a contract written by student and approved by faculty member. Results in an individual professional development portfolio.

OCCT 783. Doctoral Practicum. 10 Hours.
Semester course; variable hours (54 clinical hours/credit). 1-10 credits. Prerequisite: OCCT 761. Provides practical leadership opportunity and advanced skills in one or more areas of interest in clinical practice, administration, research, program or policy development, advocacy, education or theory development. Implements previously proposed, developed and approved project. Completes individualized specific learning objectives and evidence of learning under direct supervision or mentorship. Student must complete 540 practicum hours.

OCCT 784. Practicum Evaluation and Dissemination. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: OCCT 761. Focuses on synthesis and evaluation of doctoral practicum experience, compilation and analysis of practicum outcomes, and interpretation and application of findings or outcomes. Requires development and critique of dissemination products, written and verbal presentation.

OCCT 793. Clinical Specialty Practicum. 2-4 Hours.
Three to nine hours of concentrated clinical experience in the student's chosen area of specialization under the supervision of an experienced clinician (minimum three hours per week for each credit), and one credit hour for guided library research related to topic of practice with preparation of a paper examining the theoretical and empirical bases of practice in specialty area. A contract is prepared by the student and approved by a faculty adviser and clinical supervisor.

OCCT 798. Thesis. 3-6 Hours.
3-6 credits. Completion of a proposal for a master's degree thesis relevant to occupational therapy.

OCCT 799. Thesis. 1-6 Hours.
1-6 credits. Completion of a master's degree thesis relevant to occupational therapy.

Patient Counseling (PATC)

PATC 501. Introduction to Health Care Ministry. 1 Hour.
Semester course; 1 lecture and 1 practicum hours. 1 credit. Introduces the student to the hospital environment through observation, reading and reflection. Taught jointly with seminary faculty. Required course for dual degree program.

PATC 510. Introduction to Patient Counseling. 3-5 Hours.
Semester course; 3 lecture and optional clocked clinical hours. 3-5 credits. Introduces the student to the development and practice of spiritual care of patients and families. Includes case review and peer interaction. Assignment to the hospital is available to those seeking clinical pastoral education credit. Designed for the nonspecialist.

PATC 511. The Professional Caregiver. 4 Hours.
Semester course; 3 lecture hours and 150 clocked clinical hours. 4 credits. Prerequisite: PATC 510. Focuses upon development of professional identity and growth within the helping professions. Emphasizes the context of the health-care environment and its impact upon caregivers, patients and families. Includes practical application of theory. Incorporates the use of clinical material. Designed for the nonspecialist.

PATC 515. Basic Patient Counseling. 9 Hours.
7 lecture and 300 clinical clocked hours. 9 credits. Provides an intensive course of study toward the development of pastoral skills in the hospital context. Assigns students to select clinical areas with faculty supervision. Utilizes group process and individual supervision for the review of clinical material.

PATC 551. Selected Issues in Health Care. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated to a maximum of 2 credits. Exposes the student to a number of current trends and topics relevant to the contemporary U.S. health care delivery system. Content changes from semester to semester. Utilizes the expertise of hospital personnel.

PATC 592. Independent Study in Patient Counseling. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be repeated for a maximum of 4 credits. Provides opportunity to increase clinical and interpersonal skills in specialty areas through patient care, parallel reading and individual faculty supervision.

PATC 611. Theory and Practice of Patient Counseling I. 5 Hours.
Semester course; 3 lecture and 300 clocked clinical hours. 5 credits. Prerequisite: PATC 515 or equivalent. Emphasizes the theological foundations of pastoral care and counseling. Provides an in-depth examination of clinical material in a seminar setting.

PATC 612. Theory and Practice of Patient Counseling II. 5 Hours.
Semester course; 3 lecture and 300 clocked clinical hours. 5 credits. Prerequisite: PATC 515 or equivalent. Emphasizes psychological foundations of pastoral care and counseling. Provides an in-depth examination of clinical material in a seminar setting.

PATC 613. Group Process I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PATC 515 or equivalent. Explores, in a small group setting, the dynamics common to group behavior. Reflects upon the use of group process learning. Utilizes an experiential method of learning.

PATC 614. Group Process II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PATC 515 or equivalent. Focuses upon the various theories of group process. Focuses upon application of theory to a variety of clinical and administrative settings. Utilizes an experiential method of learning.

PATC 615. Theory of Group Leadership. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PATC 613 or 614. Explores various theories of group leadership. Provides opportunity to test skill development within a peer context.

PATC 617. Supervised Clinical Practice I. 5 Hours.
Semester course; 3 lecture and 300 clocked clinical hours. 5 credits. Prerequisites: PATC 611 and 612. Provides the opportunity to apply and practice pastoral care skills with patients and their families under faculty supervision. Emphasizes professional competence toward an integration of theological, psychological and sociological aspects of spiritual care in varied clinical contexts.

PATC 618. Supervised Clinical Practice II. 5 Hours.
Semester course; 3 lecture and 300 clocked clinical hours. 5 credits. May be repeated for a total of 10 credits. Prerequisites: PATC 611 and PATC 612. Provides the opportunity to apply and practice clinical skills in a pastoral care specialty under faculty supervision. Utilizes university and hospital personnel in specialty areas.

PATC 619. Spiritual and Social Integration Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course is a summary course required for persons in the dual-degree program. Provides in-depth reflection on the theological and social implications of ministry within the health-care environment. Course is taught jointly with seminary faculty.

PATC 620. Religious and Social Factors in Patient Counseling. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Provides an understanding of the theological and social factors related to hospitalization. Focuses on the use of ritual and tradition in caring for persons in crisis.

PATC 621. Care of the Dying. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Explores the spiritual and psychological dynamics associated with loss for patients and families. Offers special attention to the emotional and spiritual impact on caregivers that work with dying patients. Includes the use of clinical material within a group experience.

PATC 627. Living Well. 2-3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. Focuses on the development, facilitation and leadership of support groups for bereaved families. Provides students the opportunity to increase interpersonal and clinical skills in supporting families who have experienced a significant death. Special attention is offered to the needs of children. Requires participation in "Living Well," a contracted component of VCU Health System's bereavement program that utilizes art and group discussion.

PATC 629. Spirituality and Aging. 2-3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. Explores the spiritual, psychological and social dynamics associated with aging. Provides special attention to the spiritual and emotional impact on caregivers who work with aging patients. Crosslisted as: GRTY 629.

PATC 635. Clinical Ethics. 2-3 Hours.
Semester course; 2 lecture hours. 2-3 credits. Applies the principles of biomedical and health-care ethics to a more informed understanding of ethical decision making in the clinical environment. Concerned with the identification, analysis and resolution of ethical problems that arise in planning for the care of patients. Emphasizes the ethical responsibilities of clinical and pastoral caregivers.

PATC 636. Professional Identity and Ethics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Focuses on guidelines for professional ethics in the development and maintenance of professional and personal integrity, leadership ability and the enhancement of a congruency between spiritual, psychological and physical maturity.

PATC 639. Pastoral Care Management. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Surveys the theory and practice of pastoral-care management within the present health-care environment including personnel management, process improvement, benchmarking and qualitative research design. Taught cooperatively with hospital personnel.

PATC 640. Research Basics for Hospital Chaplains. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an overview of research basics within the context of hospital chaplaincy. Emphasizes the methodological issues in health services research that involve hospital chaplains.

PATC 641. Evidence-based Inquiry for Hospital Chaplains. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: PATC 640. Provides an overview of data collection, data quality and data usage within the context of hospital chaplaincy. Emphasizes an understanding of the use of data by health services administrators in operational and strategic decisions and for performance improvement.

PATC 642. Developing and Presenting Chaplaincy Research. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: PATC 640. Provides an overview of how to analyze and present evidence-based project findings and recommendations within a hospital or academic environment. Emphasizes understanding different objectives and dissemination routes for evidence-based chaplaincy projects as well as demonstrating an understanding of dissemination of evidence-based project results to relevant audiences.

PATC 653. Patient Counseling Evaluation I. 4 Hours.
Semester course; 2 lecture and 6 practicum hours. 4 credits. Focuses upon the theory and practice of case based education and clinical evaluation relevant for pastoral supervision. Observation of and reflection upon the work of ACPE supervisors are required.

PATC 654. Patient Counseling Evaluation II. 4 Hours.
Semester course; 2 lecture and 6 practicum hours. 4 credits. Continues the theoretical and practical focus of PATC 653. Students move from observation to participation in clinical evaluation of pastoral care interns.

PATC 661. History of Pastoral Supervision. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the history and development of clinical pastoral education as a movement. Exposes the student to theoretical basis of clinical pastoral education as established in professional and organizational standards.

PATC 663. Theory of Pastoral Supervision I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the literature in pastoral supervision. Emphasizes the applicability of educational and personality theory relevant for clinical pastoral education.

PATC 664. Theory of Pastoral Supervision II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Focuses on the literature related to cultural and gender factors relevant for pastoral supervision.

PATC 665. Selected Topics in Pastoral Supervision. 2 Hours.
2 lecture hours. 2 credits. May be repeated for a total of 4 credits. Presents a variety of topics on supervisory theory and practice for persons seeking certification by the ACPE. Utilizes ACPE supervisors as well as university and local seminary faculty.

PATC 692. Independent Study in Pastoral Supervision. 1-4 Hours.
Semester course; 1-4 credits. May be repeated for a total of 4 credits. Provides individual focus and direction of student readings in theories of pastoral supervision. Readings are selected from bibliography of the ACPE Certification Commission.

PATC 694. Advanced Clinical Pastoral Supervision. 7 Hours.
Semester course; 2 lecture and 15 practicum hours. 7 credits. Prerequisite: PATC 654. Advanced attention to integration of education and personality theories with theology. Includes the actual practice of supervision under faculty guidance. Restricted to individuals admitted to candidacy status in ACPE, Inc. May be repeated.

PATC 696. Intensive Supervisory Practicum. 9 Hours.
Semester course; 3 lecture and 18 practicum hours. 9 credits. Prerequisite: PATC 694. Provides opportunity for independent supervision of pastoral care interns with mentoring and evaluation by faculty. Utilizes ACPE supervisory personnel. Restricted to individuals admitted to candidacy status in ACPE. May be repeated.

PATC 697. Clinical Research. 1-5 Hours.
Semester course; 1-5 credits. May be repeated for a total of 5 credits. Provides the opportunity to test the practical application of research and process improvement methods within the clinical context. Encourages the development of collaborative and interdisciplinary project development.

Physical Therapy (PHTY)

PHTY 501. Gross Anatomy (Physical Therapy). 7 Hours.
Semester course; 4 lecture and 6 laboratory hours. 7 credits. Examines the structural and functional anatomy of the human musculoskeletal system through lecture and cadaver dissection. Develops understanding of fundamental facts and principles that apply to professional practice through lecture, dissection, radiographic examination and clinical correlation.

PHTY 502. Kinesiology. 4 Hours.
3 lecture and 2 laboratory hours. 4 credits. Introduces the student to the kinematics and kinetics of human movement. Emphasis is placed on osteokinematics, arthrokinematics and the structures that limit and/or guide movement.

PHTY 503. Applied Exercise Physiology for Wellness and Health Promotion. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to students in the professional Doctor of Physical Therapy program. Integrates principles and practices of applied physiology, health promotion, wellness and adult fitness. Emphasizes the underlying physiology with assessing physical fitness and developing therapeutic exercise prescriptions which meet recommended guidelines for achieving and maintaining optimal physical fitness and health.

PHTY 505. Applied Microscopic Anatomy for Physical Therapy. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Examines the basic components of cells in terms of their structure and function. Cells and tissues of greatest importance to physical therapists are studied in detail, and their response to injury is explored. Reviews methods of studying cells.

PHTY 506. Functional Neuroanatomy. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Examines the basic structure and function of the nervous system with special emphasis on topics of greatest concern to physical therapists. Uses neurobiological approach to integrate the basic health sciences of neuroanatomy, neurophysiology and clinical neuroscience.

PHTY 508. Musculoskeletal Physical Therapy I. 6 Hours.
Semester course; 4 lecture and 4 laboratory hours. 6 credits. Teaches some of the basic evaluation methods and measurement procedures used by physical therapists in history taking and physical examination. Includes lecture, demonstration and practice in measurement of the length and girth of body parts, manual and mechanical muscle testing, joint range of motion, accessory motion testing, and palpation.

PHTY 510. Rehabilitation I. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Introduces basic clinical skills and procedures, including measurement of vital signs, patient lifting and moving techniques, progressive mobilization, medical asepsis and principles of bandaging. Introduces medical documentation, record keeping and professional communication. Introduces communication methods and skills appropriate for interaction with patients, families and colleagues.

PHTY 512. Health Care Systems. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students in the professional Doctor of Physical Therapy program. Introduces students to issues in health care related to organization, finance, access and regulation of services for individuals, groups and communities. Provides a general overview of inter-relationships among health care consumers, providers, organizations, regulators and third-party payers. Discusses implications for public policy and legislative action. Critically reviews supplemental readings to illustrate key concepts and their relevance to the practice of physical therapy.

PHTY 520. Clinical Education I. 3 Hours.
Semester course; 1 lecture hour and 80 clinic hours. 3 credits. Introduces the profession of physical therapy. Emphasizes professionalism, ethics, professional behaviors, physical therapy extenders role and individual differences that may impact patient care. Provides an introduction to the Guide to Physical Therapy Practice and educational concepts that are related to personal growth and patient management. Includes a part-time experience in local acute care hospitals and/or home health and long-term care facilities designed to introduce the student to physical therapy practice. Allows students to develop interpersonal skills with patients, peers and other health care professionals while applying and practicing skills learned in the first professional year of education in a clinical setting.

PHTY 531. Evidence-based Practice Concepts. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Introduces concepts and principles of the research process including question, theory and hypothesis development, research design and methodology, and statistical reasoning and analysis. Discusses the basis of critical review of professional literature and determination of the relevance and applicability of research findings to specific patients with the goal of promoting evidence-based practice.

PHTY 537. Rehabilitation II. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to students in the professional Doctor of Physical Therapy program. Presents evaluation and treatment methodology for the acute care patient. Focuses on the rehabilitation phase of patient care for different patient diagnoses. Provides interprofessional opportunities with other health care professional students.

PHTY 540. Psychosocial Aspects of Physical Therapy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Introduces the student to sociocultural and psychosocial characteristics of patient populations that impact the rehabilitation process. Addresses the patient and family in the health care system, including sexuality, impact of disability, grief processes, death and dying, and selected counseling techniques.

PHTY 601. Advanced Measurement Concepts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Investigates the principles of measurement theory as applied to clinical practice. Reviews basic principles guiding electronic instrumentation and electromyography. Examines the theoretical bases for the examination and treatment approaches used in orthopedic physical therapy or neurologic physical therapy.

PHTY 603. Evidence-based Practice I. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Introduces concepts and principles of the research process including question, theory and hypothesis development, research design and methodology, and statistical reasoning and analysis. Introduces critical review of professional literature and determination of the relevance and applicability of research findings to specific patients with the goal of promoting evidence-based physical therapy practice. Teaches how to access and implement electronic search engines to locate and retrieve professional literature. Twelve lecture hours will be provided on site at the beginning of the semester; the remainder of the course will be distance-based.

PHTY 604. Evidence-based Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTY 603. Continuation of PHTY 603. Provides an advanced review of the concepts and principles of the research process and evidence-based practice. Focuses on skills needed to develop relevant clinical questions for specific patient scenarios, perform a critical appraisal of professional literature and determine the applicability of the research findings for patient management. Includes preparation of a publication-ready paper on a topic relevant to the student's practice interests. Course is entirely distance-based.

PHTY 605. Foundations for Pathokinesiology. 3,4 Hours.
Semester course; 3-4 lecture hours. 3-4 credits. A study of the principles that form a foundation for understanding pathokinesiology and therapeutic kinesiology. Integration of principles of motor development, control and learning with emphasis on abnormal motor behavior and its remediation.

PHTY 606. Therapeutic Kinesiology. 2-4 Hours.
Semester course; 1-3 lecture and 3 clinical hours. 2-4 credits. A study of motor behavior in both normal and pathological conditions. Reading and discussion of the basic literature of current neurologic approaches to therapeutic exercises and an integration of these concepts into a comprehensive model of human movement.

PHTY 609. Clinical Biomechanics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Provides an opportunity to develop knowledge in sufficient depth to understand how selected biomechanical factors influence normal and pathologic human form and movement. Stresses validity and reliability of methods of evaluating musculoskeletal form and function.

PHTY 610. Physical Therapy Evaluation in the Direct Access Setting. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Covers critical physical therapy evaluation skills necessary for autonomous practice in the adult outpatient orthopaedic setting; recognition of the clinical manifestations of medical problems that may mimic mechanical neuromusculoskeletal seen by physical therapists and screening for medical referral. Through topic discussions, case presentations and self-paced tutorials, develops skills to screen for conditions that merit physician referral when practicing in the direct access setting. Eight lecture hours will be provided on site; the remainder of the course will be distance-based.

PHTY 611. Research Process. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Readings, discussions and reports on the current status of professional literature and validation of clinical practice, clinical administration and professional education. A model for professional development, the role of research in the validation process and the basis of research design are presented non-mathematically. Required of all advanced master of science degree students unless excused by the faculty.

PHTY 613. Evidence for Orthopaedic Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PHTY 603. Evidence-based medicine course for orthopedic physical therapy. Through presentations, topic discussions and case presentations students will acquired evidence on selected topics of the evaluation and treatment of musculoskeletal dysfunctions in physical therapy practice. Promotes development of skills needed for the acquisition, reading and interpretation of published studies in the area of orthopaedic physical therapy. The entire course is distance-based.

PHTY 614. Evidence for Neurologic Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PHTY 603. Evidence-based medicine course for neurologic physical therapy. Through Web-based presentations, topic discussions and case presentations, students will acquire evidence for selected topics related to the evaluation and treatment of neurologic dysfunctions in physical therapy practice. Promotes the development of skills in the acquisition, reading and interpretation of published studies in the area of neurologic physical therapy. The entire course is distance-based.

PHTY 615. Pharmacology (Physical Therapy). 1 Hour.
Semester course; 1 lecture hour. 1 credit. Restricted to students in the Professional Doctor of Physical Therapy program. Series of lectures on the integrated approach to the study of human disease and pharmacotherapeutics. Covers the pharmacological management of common disease states affecting physical function. Emphasizes the utilization of subjective and objective patient data for the assessment, monitoring and optimization of pharmacotherapy.

PHTY 616. Evidence of Tissue Healing and Therapeutic Modalities. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PHTY 603. Distance-based course that focuses on current trends and topics of tissue healing including the effects of physical therapy interventions on healing tissues using an evidence-based approach. Reviews histology and cytology concepts relevant to clinical practice or necessary for interpreting scientific literature on the topic.

PHTY 617. t-DPT Gross Anatomy. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Focuses on musculoskeletal anatomy with high clinical relevance for physical therapists. Incorporates introductory material on diagnostic imaging of the spine and extremities. Self-directed distance learning modules will be augmented with a series of on-campus cadaver dissection laboratories over a four-day visit to campus.

PHTY 621. Therapeutic Agents. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Examines the theoretical bases for and therapeutic application of thermal, mechanical and electrical agents. Emphasizes the physical and physiological effects, indications and contraindications for electrical current, diathermy, superficial heat and cold, massage, ultraviolet, traction, ultrasound, laser and compression therapy. Analyzes relative current scientific literature and uses laboratories for practice and clinical problem-solving.

PHTY 623. Cardiopulmonary Physical Therapy. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Applies principles of pathophysiology of the cardiovascular and respiratory systems; includes physical therapy assessment and treatment of patients with cardiac and respiratory disorders.

PHTY 624. Clinical Problem-solving I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students in the Professional Doctor of Physical Therapy program. Provides an advanced review of the concepts and principles of the research process and evidence-based practice. Focuses on skills needed to perform a critical appraisal of professional literature and to determine the relevance and applicability of research findings to a specific patient or series of patients based on information collected during the first summer clinical experience. Provides opportunity to develop oral patient case presentation skills.

PHTY 626. Lifespan I. 6 Hours.
Semester course; 9 lecture and laboratory hours. 6 credits. Restricted to students in the professional Doctor of Physical Therapy program. Covers models of typical motor, psychosocial, neurological and musculoskeletal development from birth through adolescence; models of neurologic dysfunction in developmental disabilities; principles of examination and evaluation in pediatrics; commonly seen diagnoses; and treatment planning for a pediatric population.

PHTY 627. Lifespan II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Discusses age related changes in physical structure, motor control and psychosocial/cognitive issues in humans from middle adulthood to the end of life. Emphasizes the geriatric population and the physical therapy management of problems with the integumentary system. Highlights the role of the physical therapist in making program modifications based on age related changes.

PHTY 629. Special Topics in Physical Therapy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an opportunity to pursue and present a topic of interest that is related to physical therapy evaluation and treatment.

PHTY 640. Neurologic Physical Therapy. 6 Hours.
Semester course; 4 lecture and 4 laboratory hours. 6 credits. Applies principles of motor development, control and learning to the evaluation and remediation of motor disorders. Critically surveys current theory and practice of neuromotor therapeutics.

PHTY 644. Orthotics and Prosthetics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prepares the student to participate as a member of the professional prosthetic or orthotic clinic team, integrates material from other courses, and teaches basic skills in orthotic and prosthetic assessment, prescription, and training and performing initial and final prosthetic and orthotic checkouts.

PHTY 646. Clinical Medicine. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Covers topics in clinical medicine and the sciences relevant to the practice of physical therapy. Medical practitioners from the VCU Medical Center and surrounding areas participate.

PHTY 648. Musculoskeletal Physical Therapy II. 5 Hours.
Semester course; 4 lecture and 2 laboratory hours and 24 clinical hours. 5 credits. Examines principles and techniques used by physical therapists for the treatment of patients with orthopaedic disorders. Uses scientific evidence and theoretical rationale in a problem-solving approach to develop treatment plans for patients with orthopaedic musculoskeletal disorders. Provides opportunities for students to gain hands-on experiences with patients in a clinical setting.

PHTY 650. Clinical Education II. 8 Hours.
Semester course; 320 clock hours. 8 credits. Restricted to students in the Professional Doctor of Physical Therapy program. Eight-week, full-time clinical experience designed to develop competency in physical therapy evaluation and treatment. Teaches the use of sound scientific rationale and problem solving skills in aspects of patient care. Promotes the development of an independent professional through synthesis and utilization of advanced academic theory in evaluation and treatment. Encourages the exploration of interest areas in a variety of practice settings.

PHTY 651. Professional Issues in Physical Therapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students in the Professional Doctor of Physical Therapy program. Discusses professional issues facing the modern physical therapy practitioner, including ethical decision making, state and national current physical therapy issues, and legislative efforts. Provides opportunity for advancing skills in educational techniques, assertiveness skills, conflict resolution, as well as preparation for employment via resume and portfolio writing and interview skills.

PHTY 654. Clinical Problem-solving II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Restricted to students in the Professional Doctor of Physical Therapy program. Provides the opportunity to review, integrate and develop strategies using previously presented material and research to present an oral case study of a patient or patients from the clinical experience in the previous summer.

PHTY 660. Musculoskeletal Physical Therapy III. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Prerequisites: PHTY 508 and PHTY 648. Synthesizes information from the prerequisite classes through case study examples, hands-on practice and lecture on the incorporation of musculoskeletal evaluation and treatment. Emphasizes clinical reasoning in determining individualized physical therapy interventions based off of a comprehensive physical therapy evaluation. Focuses on case study examples of complicated patient presentations to help better prepare students to treat patients with multiple co-morbidities and impairments. Highlights commonly seen movement pattern dysfunctions throughout the course to help students to both identify and treat regional interdependent impairments related to the patient's primary complaint.

PHTY 661. Administration and Management in Physical Therapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students in the Professional Doctor of Physical Therapy program. Provides students with a basic understanding of operational issues related to physical therapy practice in a variety of settings. Topics include leadership, operational and business success measures, reimbursement, quality assurance, performance improvement, utilization review, risk management, documentation and marketing. Skill sets include, at an introductory level, supervision, delegation, hiring practices, budget development and analysis, peer review, outcomes measurement, and ethical decision making.

PHTY 670. Clinical Integration of Physical Therapy Concepts. 2 Hours.
Semester course; 2 credits. Restricted to students in the Professional Doctor of Physical Therapy program. Uses case studies in a problem-based learning approach, which will allow students to integrate knowledge about patient evaluation and assessment with treatment design, implementation, and progression. Utilizes current literature to support treatment interventions. Includes topic areas: pediatrics, orthopaedics, neurology, oncology, cardiac rehabilitation, integumentary systems and acute care/ICU.

PHTY 674. Clinical Problem-solving III. 1 Hour.
Semester course; 1 lecture 1 credit. Restricted to students in the Professional Doctor of Physical Therapy program. Integrates material from D.P.T. courses with clinical research. Provides experience in writing individual case reports dealing in depth with the history, current status and problems in a given area of clinical specialization.

PHTY 676. Comprehensive Study of Physical Therapy Practice. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Reviews topics in practice patterns of neuromuscular, musculoskeletal, cardiovascular, integumentary and professionalism relative to physical therapy practice. Prepares students for the national physical therapy examination.

PHTY 680. Clinical Education III. 12 Hours.
Semester course; 480 clinical hours. 12 credits. Twelve-week full-time clinical experience designed to allow the student to develop entry-level competence in physical therapy evaluation and treatment techniques. Includes the use of sound scientific rationale and problem-solving skills in all aspects of patient care. Promotes the development of an independent professional through synthesis and utilization of advanced academic theory in evaluation and treatment. Graded P/F.

PHTY 690. Physical Therapy Graduate Seminar. 16 Hours.
Semester course; 1 credit. Provides opportunity to develop knowledge and skills in evaluating published scientific literature related to physical therapy, developing researchable questions and orally presenting the material in a professionally appropriate manner.

PHTY 691. Special Topics in Physical Therapy. 1-4 Hours.
1-4 credits. Guided independent study of specific topics not discussed in courses or discussed in less detail in courses. Student's desired topic of study must be identified and approved prior to enrollment.

PHTY 692. Clinical Specialty Seminar. 0.5-3 Hours.
Semester course; 0.5-3 credits. Individual reports dealing in depth with the history, current status and problems in a given area of clinical specialization.

PHTY 693. Clinical Specialty Practicum. 1-9 Hours.
60 clock hours per credit. 1-9 credits. Concentrated clinical experience under the guidance of an approved preceptor.

PHTY 695. Clinical Education IV. 12 Hours.
Semester course; 480 clinical hours. 12 credits. Twelve-week full-time clinical experience designed to allow the student to develop entry-level competence in physical therapy evaluation and treatment techniques. Includes the use of sound scientific rationale and problem-solving skills in all aspects of patient care. Promotes the development of an independent professional through synthesis and utilization of advanced academic theory in evaluation and treatment. Graded P/F.

PHTY 798. Research in Physical Therapy. 1-15 Hours.
1-15 credits. Research in preparation for the advanced master of science degree thesis or doctoral dissertation.

Rehabilitation and Movement Science (REMS)

REMS 540. Cardiovascular Pathophysiology and Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HPEX 375 and HPEX 440 or equivalents. Presents theoretical principles of electrocardiography and the effects of pharmacological intervention in the treatment of cardiovascular disease. Specific emphasis placed on myocardial ischemia, myocardial infarction and their treatment through exercise rehabilitation protocols. The impact of pharmacological agents on the ECG and on exercise are explored.

REMS 608. Advanced Musculoskeletal Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the structure and function of tissues of the musculoskeletal system. Investigates mechanisms of healing of these tissues and explores the affects of various modalities, altered use and disease on the structure and function of musculoskeletal tissues.

REMS 611. Biomechanics of Human Motion. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Applies knowledge and methods of mechanics in the study of the structure and function of the human body as applied to sport, physical activity and rehabilitation. Topics include kinematics, kinetics and methods of biomechanical analysis.

REMS 612. Advanced Biomechanics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: REMS 611 or permission of instructor. Enrollment restricted to students registered in the REMS program or with permission of instructor. Applies advanced biomechanics techniques to the evaluation and quantification of human performance. Encourages scientific thought with practical applications.

REMS 660. Neuromuscular Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the interrelationships between the musculoskeletal and neuromuscular systems. Includes examination of normal and abnormal biomechanics of the musculoskeletal system, biomechanical factors related to human performance, as well as acute and chronic adaptations of the neuromuscular system. Emphasizes how these principles can be applied to physical training in healthy and diseased populations and treatment and rehabilitation in the sports medicine setting.

REMS 665. Instrumentation in Motion Analysis. 3 Hours.
2 lecture and 2 laboratory hours. 3 credits. Designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Examines theories, principles, and applications of systems used to qualify and characterize movement.

REMS 690. Research Seminar in Rehabilitation and Movement Science. 0.5 Hours.
Seminar course; 0.5 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Presentation and discussion of research reports and topics of interest. Advances skills in critical analysis and discussion leadership. Topics and research presentations vary from semester to semester and are coordinated by the instructor of record. May be repeated. Graded as pass/fail.

REMS 692. Independent Study. 1-3 Hours.
Semester course; 1-3 hours. 1-3 credits. May be repeated for 6 credits. Determination of the amount of credit and permission of the instructor and division head must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in health or movement sciences. Crosslisted as: HEMS 692.

REMS 701. Advanced Exercise Physiology I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501 or other graduate-level mammalian physiology course or permission of instructor. Investigates the effect of acute and chronic exercise stimuli on human performance and select disease states. Topics to be addresses include exercise bioenergetics, metabolic responses to exercise, contributions to substrate selection and utilization during exercise, muscular performance and adaptations to exercise training, cardiovascular adaptation to exercise, aerobic and anaerobic training programs, and effects of training on fitness and performance.

REMS 702. Advanced Exercise Physiology II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHIS 501 or other graduate-level mammalian physiology course or permission of instructor, and REMS 701. Investigates the effect of physiological stressors on human performance and health through lecture and article discussion. Topics to be addressed include exercise in the heat and cold, effects of altitude on physical performance, acute and chronic endocrine responses to exercise, role of adipokines in chronic disease conditions, the use of ergogenic aids in sport.

REMS 703. Cardiovascular Exercise Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. Investigates the structural, functional and cellular principles of human cardiovascular physiology as applied to health and human performance. Emphasis will be placed on the metabolic, contractile and hemodynamic adaptations to acute and chronic exercise training.

REMS 704. Psychobiology of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. "Psychobiology" is defined as the integrative study of behavior from the social, cognitive and biological levels of analysis. This course will include an examination of the research that encompasses psychophysiology, psychoneuroendocrinology, psychoneuroimmunology, neuroscience, physiological psychology and behavioral genetics applied to exercise.

REMS 705. Metabolic Aspects of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. This course is designed to explore the thermic effects of physical activity in apparently healthy individuals, as well as those with increased risk for cardiovascular, metabolic or other inflammatory diseases. Additionally, the relationship between physical activity and food intake, resting metabolic rate and dietary-induced thermogenesis will be reviewed. The examination of gastrointestinal function during dietary manipulation will also be assessed to address performance enhancement in several types of physical activities. This course will emphasize the metabolic control of ATP synthesis, which includes carbohydrate, lipid and protein metabolism and their interaction with one another in response to biological needs during rest and physical activity.

REMS 706. Development and Motor Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to the REMS program or by permission of instructor. Explores theories of developmental motor control and examines theoretical influences on development of infants and young children who are typically developing as well as those with developmental disabilities. Engages students in critical literature review relevant to motor development and rehabilitation and in the application of theory to practice and research design.

REMS 710. Research Techniques in Rehabilitation and Movement Science. 1-3 Hours.
50 hours of laboratory times per credit hour. 1-3 credits. Prerequisite: Permission of instructor required. Examines and explores laboratory techniques used in rehabilitation and movement science research. Provides opportunity to begin transitioning clinical problems to research questions. Opportunities in laboratories of the rehabilitation and movement science program or other laboratories approved by the adviser or program directors. Focuses on individual student learning needs. Graded as pass/fail.

REMS 793. Teaching Practicum in Higher Education. 1 Hour.
50 hours of contact/preparation time for each credit. 1 credit. Practicum designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science degree program. Develops skills necessary for classroom teaching including preparing and presenting selected topic (s), writing test questions, and grading examinations. May be repeated for additional teaching experience. Graded as pass/fail.

REMS 794. Research Presentation Seminar. 1 Hour.
1 lecture hour. 1 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Develops presentation skills. Requires preparation and presentation of research at a public research forum scheduled by the instructor of record. Students are expected to submit their research for presentation at a selected regional, national or international conference in a related field. Graded as pass/fail.

REMS 798. Research in Rehabilitation and Movement Science. 1-12 Hours.
Semester course; 1-12 credits. Research leading to the Ph.D. degree and elective research projects for students in the Rehabilitation and Movement Science doctoral program. May be repeated. Graded as "S," "U" or "F.

Rehabilitation Counseling (RHAB)

RHAB 502. American Sign Language I. 3 Hours.
Semester course; 3 credits. Introduces the rules and grammatical structure of ASL with a focus on grammar and vocabulary to increase the learner's expressive and receptive understanding of the language. Provides an introduction to Deaf culture and crosscultural interactions, and to tactile and close-vision communication techniques used by individuals who are deaf-blind.

RHAB 503. American Sign Language II. 3 Hours.
Semester course; 3 credits. Provides continued study of the grammatical structure of ASL; introduction of additional vocabulary with emphasis on expressive and receptive competence; continued study of the tactile and close-vision communication techniques used by individuals who are deaf-blind; and continued study of the Deaf culture.

RHAB 521. Addiction Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a biopsychosocial overview of addiction and addictive disorders. Reviews contemporary theories of addiction, pharmacological classification of psychoactive substances and contemporary approaches toward assessment, diagnosis, treatment and community support. Reviews cultural, legal and historical factors regarding substance use and addictive processes.

RHAB 522. Clinical Evaluation, Assessment and Treatment Planning in Substance Abuse Rehabilitation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: RHAB 521. Stresses development of professional competencies. Focuses on systematic approach to screening and on-going assessment; diagnostic criteria for dependence and abuse; testing and interviewing; co-morbidity; collaborative approaches to individualized clinical treatment planning; awareness of treatment resources.

RHAB 523. Contemporary Issues in Substance Abuse Treatment and Recovery. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: RHAB 521. Examines current issues and research in the field. Includes topics such as denial, social isolation, intervention; lifelong nature of recovery, support needs, relapse prevention; legal, political and ethical issues; special populations (e.g., physical disability); poly-drug abuse; perinatal addiction; program administration; professional readiness.

RHAB 525. Introduction to Rehabilitation Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of history, philosophy, legislation, organizational structure and trends in the rehabilitation profession. Focuses on attitudinal, social and environmental barriers to the inclusion of people with disabilities; professional identity, roles and functions; CRC Code of Ethics; CRC Standards of Practice; and career options.

RHAB 526. Introduction to Mental Health Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of history, philosophy, legislation, organizational structure and trends in mental health counseling. Focuses on advocacy; professional identity, roles and functions; ethics; counseling certification and licensure; and career options.

RHAB 533. Directed Readings in Rehabilitation. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 6 credits. Provides intensive study in one or more topical areas of rehabilitation through directed readings under the supervision of a faculty member.

RHAB 611. Theories of Professional Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a deep understanding of the major theoretical approaches, models and strategies to effective counseling, consultation, prevention, advocacy and wellness programs with an emphasis on common factors and evidence-based effectiveness. The intent is to assist students in developing an ethical and culturally relevant yet personal model of counseling.

RHAB 612. Group Counseling Theories and Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Reviews theoretical foundations of group work, group dynamics and processes, group therapeutic factors, and characteristics and functions of effective group leaders. Reviews ethical and culturally relevant strategies for designing, implementing and facilitating a variety of group approaches. Provides experience in group participation and development of group leadership skills.

RHAB 613. Advanced Rehabilitation Counseling Seminar. 3-9 Hours.
3-9 lecture hours. 3-9 credits. Prerequisites: RHAB 611 and RHAB 612 or permission of instructor. This course is designed to provide an opportunity for students to undertake a more in-depth study of selected approaches to individual and/or group counseling of rehabilitation clients. Principles and techniques relevant to vocational, educational, and personal adjustment problems related to severe and multiple disabilities will be systematically explored and studied. Audio visual tape experience will be offered.

RHAB 614. Counseling, Death and Loss. 3 Hours.
3 lecture hours. 3 credits. Prerequisite: RHAB 611 or permission of instructor. Explores the psychosocial processes of adaptation to severe losses such as those occasioned by the onset of disability, death and developmental life changes. Emphasizes the knowledge and skills required by rehabilitation counselors in dealing with losses experienced by their clients.

RHAB 615. Human Growth and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the major themes of research on human development over the lifespan -- from conception through adulthood. Focuses on the physical, emotional, social and cognitive aspects across the lifespan. Emphasizes how developmental processes relate to persons with disabilities and impact the work of rehabilitation and other helping professions.

RHAB 616. Couples and Family Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of approaches to couples and family counseling. Instruction in the theoretical foundation and interventions in couples and family therapy will be examined.

RHAB 623. Career Counseling and Job Placement. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of major theories of career development with emphasis on theories relevant to rehabilitation practice. Explores occupational information and job matching systems, career counseling techniques, and major job placement approaches and techniques, with emphasis on demand-side job placement.

RHAB 624. Assessment and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines principles of measurement, assessment and diagnosis in rehabilitation and mental health counseling; test selection, administration and interpretation; accommodating individuals with disabilities in the testing process. Includes an overview of the major domains in assessment.

RHAB 625. Research and Program Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines basic principles rehabilitation research and program evaluation, including an emphasis on the critical review of published research for use in rehabilitation and mental health counseling practice. Focuses on students' understanding of the application of research and program evaluation tools to enhance the quality of rehabilitation services delivered.

RHAB 633. Case Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores history, theory, practice and ethics of case management as well as the full range of community resources as these contribute to successful outcomes. Reviews and critically analyzes benefit systems, treatment and life care planning, coordination and delivery of services, disability management, documentation, and case studies.

RHAB 640. Medical and Psychosocial Aspects of Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the major disabilities encountered by rehabilitation and mental health counselors. Focuses on functional limitations and the process of psychological adjustment.

RHAB 642. Diagnosis and Treatment of Mental Health Disorders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the major mental disorders and their etiology, prevalence, diagnosis and impact on individuals and society. Reviews the prevailing multiaxial classification systems and diagnostic processes, procedures and nomenclatures currently used in clinical practice. Provides an overview of rehabilitation and mental health treatment planning and interventions using a biopsychosocial framework.

RHAB 644. Alcohol and Human Behavior. 3 Hours.
3 credits. Prerequisites: RHAB 521, RHAB 522, RHAB 523 and RHAB 695, or permission of instructor. Understanding the significance of behavior as a tool in diagnosing, treating and/or referring the addict; appreciation of particular cues to observe the predominant behavior associated with living problems and reflected by the alcohol or drug abuser.

RHAB 654. Multicultural Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of multicultural counseling theories and techniques. Provides an understanding of how human development, family, gender, race and ethnicity impact upon the process of adjustment to disability.

RHAB 681. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 682. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 683. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 684. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 685. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 686. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 687. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 688. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 689. Institutes and Workshops in Rehabilitation. 1-3 Hours.
Orientation institutes and other short-term training programs are offered for rehabilitation counselors newly recruited to the rehabilitation field and for the further professional development of those already employed. Content will vary according to the aims of the institutes or workshops. Length of time and number of credits are announced prior to each institute or workshop.

RHAB 691. Counseling Techniques. 3 Hours.
Semester course. 3 credits. Provides experience and practice in the basic counseling skills related to the helping process. Examines the variety of clinical settings available for professional preparation. Provides the necessary level of skill development for students to participate in internship.

RHAB 692. Advanced Professional Issues in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: RHAB 691. Provides an advanced overview of professional identity, roles and functions; counseling practice issues; supervision; and specialized counseling techniques in rehabilitation and mental health counseling. Includes 100 hours of supervised rehabilitation and mental health counseling practicum.

RHAB 693. Introduction to Field Experiences for Rehabilitation Counselors. 3 Hours.
3 credits. This course provides for concurrent field experience and is designed for students who have no training or experience in interviewing and counseling in rehabilitation settings.

RHAB 694. Job Placement in Rehabilitation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores occupational information, job matching systems and job placement approaches. Focuses on demand-side job development, job seeking skills training, supported employment, transitional work and placement techniques including job analyses, ADA implementation and labor market surveys.

RHAB 695. Supervised Clinical Practice in Substance Abuse Rehabilitation. 3-9 Hours.
Semester course; 3-9 clinic/field experience hours (3 credits per 200 hours of supervised internship). 3-9 credits. May be repeated in increments of 3 credits; must have 9 credits toward degree completion. Prerequisite: RHAB 692. Enrollment restricted to students who have completed 30 graduate credits. Emphasizes mastery of substance abuse setting-specific roles and functions of the professional rehabilitation counselor. Stresses ethical decision-making in practice. Involves scheduled seminars and meetings with faculty and agency supervisor.

RHAB 696. Supervised Clinical Practice in Rehabilitation and Mental Health. 3-9 Hours.
Semester course; 3-9 clinic/field experience hours (3 credits per 200 hours of supervised internship). 3-9 credits. May be repeated in increments of 3 credits; must have 9 credits toward degree completion. Prerequisite: RHAB 692. Enrollment restricted to students who have completed 30 graduate credits. Emphasizes mastery of setting-specific roles and functions of the professional rehabilitation and mental health counselor. Stresses ethical decision-making in practice. Involves scheduled seminars and meetings with faculty and agency supervisor.

RHAB 697. Supervised Clinical Practice in Counseling. 1-6 Hours.
Semester course; 1-6 credits. (1 credit per 100 hours of supervised internship.) May be repeated to a maximum of 9 credits. Prerequisite: Admission into advanced certificate in professional counseling program. Emphasizes advanced development of counseling skills pursuant to licensure or other post-master's training needs. Stresses ethical decision making in practice. Involves scheduled seminars and meetings with faculty and agency supervisor.

College of Humanities and Sciences

Anthropology (ANTH)

ANTH 551. Anthropology for the Museologist. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A discussion and investigation of contemporary anthropological themes and questions and identification of how they can be depicted with museum materials. Students are expected to develop a research design for an exhibit.

ANTH 556. Historical and Cultural Landscapes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to seniors who have completed ANTH 302 or 303 and graduate students with permission of instructor. Students will study historical and contemporary landscapes as the products of the producers of human culture, with particular attention to riverine landscapes. Focus will be on the ways in which humans shape and respond to their ecosystems. Students will participate in an active field research program, including the archaeological recovery and analysis of historical landscapes. Crosslisted as: ENVS 556.

Biology (BIOL)

BIOL 502. Microbial Biotechnology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MICR/BIOC 503 or BIOC 530, 531, 532 and 533 or equivalent, and MICR/BIOC 504 or equivalent. Open to qualified seniors and graduate students only. Discussion of the application of basic principles to the solution of commercial problems. The course will cover the historical principles in biotransformations as related to primary and secondary metabolism, as well as recombinant DNA technology and monoclonal antibodies and products resulting from the application of recombinant DNA technology.

BIOL 503. Fish Biology. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Prerequisite: BIOL 317 or equivalent. Open to qualified seniors and graduate students only. Classification, behavior, physiology and ecology of fishes. Laboratories will emphasize field collection of fish and identification of specimens.

BIOL 507. Aquatic Microbiology. 4 Hours.
Semester course; 2 lecture and 4 laboratory hours. 4 credits. Prerequisites: BIOL 303 and 307 or equivalents. Open to qualified seniors and graduate students only. This course will involve a practical approach to the methods used to culture, identify and enumerate specific microorganisms that affect the cycling of elements in aquatic systems and those that affect or indicate water quality.

BIOL 508. Barrier Island Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 317 or equivalent, or permission of instructor. A study of the physical factors affecting the formation of barrier islands, adaptations of plants and animals for colonization and persistence in these harsh environments, and how coastal ecological processes conform to general ecological theory. Examples and problems pertaining to Virginia and the southeastern United States are emphasized.

BIOL 509. Microbial Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 317 or equivalent with a grade of C or better. Open only to qualified seniors and graduate students. Explores the interactions of microorganisms and their environment, including discussion of microbial diversity, nutrient cycling, symbiosis and selected aspects of applied microbiology.

BIOL 510. Conservation Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open to qualified seniors and graduate students only. Explores the accelerated loss of species due to increasing human population pressure and the biological, social and legal processes involved in conserving biodiversity.

BIOL 512. Plant Diversity and Evolution. 4 Hours.
Semester course; 3 lecture and 4 laboratory hours. 4 credits. Prerequisites: BIOL 300 and 310 or equivalents, or permission of instructor. Taxonomy, diversity and evolutionary history of vascular plants (including ferns, gymnosperms and flowering plants). Lecture emphasis on evolutionary relationships; laboratory emphasis on plant recognition and identification, especially of the Virginia flora, including some field trips to areas of local botanical interest.

BIOL 514. Stream Ecology. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Prerequisite: BIOL 317. Open to qualified seniors and graduate students only. A study of the ecology of streams and rivers. Laboratory emphasis is on the structure and functioning of aquatic communities in mountain to coastal streams.

BIOL 516. Population Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT/BIOS 543. Theoretical and empirical analyses of how demographic and evolutionary processes influence neutral and adaptive genetic variation within populations. Crosslisted as: HGEN 516.

BIOL 518. Plant Ecology. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. One three-day field trip is required. 4 credits. Prerequisite: BIOL 317. Open to qualified seniors and graduate students only. A lecture, field and laboratory course concerned with the development, succession and dynamics of plant communities and their interrelations with climate, soil, biotic and historic factors.

BIOL 519. Forest Ecology. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Prerequisite: BIOL 317 or equivalent. Enrollment restricted to graduate students and upper-level undergraduates. Covers advanced topics in forest ecology, with a particular emphasis on Virginia's diverse forest ecosystems. Students gain an understanding of the principal controls on forest structure, growth and distribution and apply these principles to the development and execution of a graduate-level field research project.

BIOL 520. Population Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 310 and BIOL 317 or permission of instructor. Open to qualified seniors and graduate students only. Theoretical and empirical analysis of processes that occur within natural populations, including population genetics, population growth and fluctuation, demography, evolution of life history strategies and interspecific interactions. Quantitative models will be used extensively to explore ecological concepts.

BIOL 521. Community Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 317 or equivalent. Open to qualified seniors and graduate students only. Theoretical and empirical analysis of the structure and function of natural communities, ecosystems and landscapes.

BIOL 522. Evolution and Speciation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 310 or equivalent. Open to qualified seniors and graduate students only. Evolutionary principles, with emphasis on genetic and environmental factors leading to changes in large and small populations of plants and animals, and the mechanisms responsible for speciation.

BIOL 524. Endocrinology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 300 and CHEM 301-302 and CHEZ 301L, 302L or equivalent. Open to qualified seniors and graduate students only. Hormonal control systems at the organ, tissue and cellular level. Although the major emphasis will be on vertebrate endocrine systems, some discussion of invertebrate and plant control systems will be covered.

BIOL 530. Introduction to Human Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to qualified seniors and graduate students. Basic knowledge of genetics is recommended. Provides a comprehensive examination of the fundamentals of human genetics. Explores topics including Mendelian and non-Mendelian inheritance, pedigree analysis, cytogenetics, aneuploid syndromes, cancer, gene structure and function, epigenetics, gene expression, biochemical genetics, and inborn errors of metabolism.

BIOL 532. Water Pollution Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 317 or equivalent and one year of general chemistry. A study of various forms of pollution in aquatic environments, including the basic principles and effects of water pollution on aquatic organisms and ecosystems, ecotoxicology, waterborne pathogens, invasive species, water pollution monitoring and environmental laws.

BIOL 535. Wetlands Ecology. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Prerequisite: BIOL 317 or equivalent or permission of instructor. A study of the ecology of freshwater and coastal wetlands, including the physical and biological aspects of these systems, wetland functions at local, landscape and global scales, and wetland regulations and restoration. Students will acquire skills with analytical techniques used in laboratory settings and in field-based applications for purposes of identifying and delineating wetland ecosystems.

BIOL 540. Fundamentals of Molecular Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 310 or consent of instructor. The basic principles and methodologies of molecular biology and genetics are applied to genome organization, replication, expression, regulation, mutation and reorganization. Emphasis will be placed on a broad introduction to and integration of important topics in prokaryotic and eukaryotic systems. Crosslisted as: BNFO 540.

BIOL 541. Laboratory in Molecular Genetics. 2 Hours.
Semester course; 1 lecture and 4 laboratory hours. 2 credits. Pre- or corequisite: BIOL 540 or equivalent. Experiments are designed to apply advanced techniques and concepts of molecular biology and genetics using prokaryotic and eukaryotic systems. Emphasis will be placed on experimental design, integrating results throughout the semester, making use of relevant published literature, scientific writing and providing hands-on experience with advanced equipment and methodologies. Crosslisted as: BNFO 541.

BIOL 545. Biological Complexity. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisites: physics and calculus, or permission of instructor. Open only to graduate students and qualified seniors. An introduction to the basis of complexity theory and the principles of emergent properties within the context of integrative life sciences. The dynamic interactions among biological, physical and social components of systems are emphasized, ranging from the molecular to ecosystem level. Modeling and simulation methods for investigating biological complexity are illustrated. Crosslisted as: LFSC 510.

BIOL 548. Bioinformatic Technologies. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: BIOL 545/ LFSC 510 or permission of instructor. Introduction to the hardware and software used in computational biology, proteomics, genomics, ecoinformatics and other areas of data analysis in the life sciences. The course also will introduce students to data mining, the use of databases, meta-data analysis and techniques to access information. Crosslisted as: LFSC 520.

BIOL 550. Ecological Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open to qualified seniors and graduate students only. Introduces the principles of ecological genetics, especially those with foundations in population and quantitative genetics, and illustrates conceptual difficulties encountered by resource stewards who wish to apply genetic principles. Explores various types of biological technologies employed by conservation geneticists and provides means for students to gain experience in analyzing and interpreting ecological genetic data.

BIOL 560. Conservation Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces students to key elements of wildlife diseases, zoonoses, emerging infectious diseases associated with wildlife and humans, and both the conservation and health impacts of these topics. Included are discussions of the interactions among environmental quality and wildlife and human diseases and health. Topics include diseases of fish, amphibians, reptiles, birds and mammals, the effects of environmental contaminants and climate on those diseases, and their interaction with human health.

BIOL 565. Advances in Cell Signaling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 300 or equivalent. Topical course focusing on advances in cellular communication by cytokines, hormones and neurotransmitters. Each semester, the course focuses on a different topic. Past topics have included cancer biology, allergy and asthma, and autoimmunity.

BIOL 580. Eukaryotic Biotechnology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOL 310 and BIOZ 310L, or graduate standing in biology or related fields. Open to qualified seniors and graduate students only. Discussion of principles, concepts, techniques, applications and current advances in cellular and molecular biology aspects of biotechnology for animal and plant cells. The course will cover molecular construction of foreign genes; DNA cloning; technologies for DNA, RNA and protein analyses; nonvector and vector-mediated genetic transformation; gene regulation in transgenic cells; cell and tissue culture; cell fusion; and agricultural, medical and other industrial applications.

BIOL 591. Special Topics in Biology. 1-4 Hours.
Semester course; 1-4 credits. An in-depth study of a selected topic in biology. See the Schedule of Classes for specific topics to be offered each semester and prerequisites. If several topics are offered, students may elect to take more than one.

BIOL 601. Integrated Bioinformatics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Presents major concepts in bioinformatics through a series of real-life problems to be solved by students. Problems addressed will include but not be limited to issues in genomic analysis, statistical analysis and modeling of complex biological phenomena. Emphasis will be placed on attaining a deep understanding of a few widely used tools of bioinformatics. Crosslisted as: BNFO 601.

BIOL 603. Fundamentals of Scientific Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing. The purpose of this course is to prepare students to successfully work as members and leaders of diverse scientific teams during their graduate studies and in multiple scientific career paths. Students will be familiarized and gain experience with key concepts of teams and leading teams, including values-based missions and goals, effective communication and feedback, stages of team development and leadership, diversity and inclusivity, mentoring and coaching, resolving conflict, project management, leading change, leaving a legacy, and assessment.

BIOL 606. Quantitative Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Principles and applications of mathematical ecology at the community level, including experimental design; sampling techniques, assumptions and limitations; and the use of cluster analysis, gradient analysis and ordination to evaluate, summarize and compare large data sets.

BIOL 610. Conservation Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the implementation of conservation techniques including monitoring, planning, education, habitat management and combining conservation with human development strategies. Focuses on how to make conservation work where biodiverstiy and human livelihoods must be reconciled. Students will utilize a number of computer programs to analyze and interpret management strategies.

BIOL 618. Ecosystems Ecology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 317 or equivalent or permission by instructor. Introduction to the structure and functioning of aquatic and terrestrial ecosystems. The course complements other offerings in the graduate program by considering ecological processes at higher orders of organization and in the context of abiotic factors. Students will gain discipline-specific knowledge through lectures and readings while building quantitative and critical thinking.

BIOL 620. Biogeochemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to graduate students. This course will examine the biogeochemical cycles of carbon, nitrogen, phosphorus, sulfur and iron on Earth from both a historical perspective and in the context of global environmental change, considering the cycles individually while also acknowledging that there are significant interactions between these cycles. Examples of biogeochemical processes will be drawn from multiple ecosystems, ranging from terrestrial soils to the deep ocean.

BIOL 626. Physiological Ecology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: BIOL 317 or equivalent. This course examines the physiological adjustments and adaptations made by organisms in response to their environment.

BIOL 630. Patterns of Mammalian Reproduction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive ecological and evolutionary study of specializations and adaptive radiation in mammalian reproductive anatomy, the reproductive cycle, seasonality of reproduction and factors affecting litter size and developmental state of neonates. Human reproductive biology is included when pertinent.

BIOL 640. Evolution and Molecular Markers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Methodologies and applications of molecular biology as they pertain to the study of evolution, with a focus on systematics, speciation and biogeography. The course provides proficiency in the understanding, interpretation and choice of appropriate molecular markers for evolutionary research, with particular attention to current methods and recent literature. Designed to benefit students of both natural history (ecologists, systematics, evolutionary biologists) and molecular biology.

BIOL 650. Conservation Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the application of molecular genetics to biodiversity conservation. Essential topics include molecular measures of genetic diversity, estimating loss of genetic diversity in small populations, detecting inbreeding, resolution of taxonomic uncertainties, genetic management of T&E species, captive breeding and reintroduction. Students will utilize a number of computer programs to analyze and interpret molecular genetic data.

BIOL 654. Environmental Remote Sensing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ENVS 602, or permission of the instructor. This course provides a basic and applied understanding on the use of digital remote sensor data to detect, identify and characterize earth resources. Students are required to demonstrate an understanding of the spectral attributes of soils, vegetation and water resources through various labs involving both image- and non-image-based optical spectral data. Crosslisted as: ENVS 654/URSP 654.

BIOL 660. Developmental Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: biochemistry or cell biology or their equivalent. Molecular and cellular principles of developmental biology in model systems, including flies, worms, fish and mammals. Understanding of morphogen gradients, transcription, cell movements and signaling in development. Advanced methods are taught enabling students to interpret and present findings from the primary literature.

BIOL 676. Plant and Animal Cell Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: biochemistry or cell biology or permission of instructor. Molecular and cellular principles of cell behavior and function in plant and animal cells. Topics include intracellular transport, cell cycle control, signaling and cell motility. Advanced methods are taught enabling students to interpret and present findings from the primary literature in this field.

BIOL 690. Biology Seminar. 1 Hour.
Semester course; 1 credit. May be repeated for credit. Presentations by faculty and visiting lecturers, and discussions of research and developments in biology and related fields. Graded as S/U/F.

BIOL 691. Special Topics in Biology. 1-4 Hours.
Semester course; variable hours. 1-4 credits. An advanced study of a selected topic in biology. See the Schedule of Classes for specific topics to be offered each semester and prerequisites. If several topics are offered, students may elect to take more than one.

BIOL 692. Independent Study. 1-4 Hours.
Semester course; hours to be arranged. Credits to be arranged. Determination of the amount of credit and permission of instructor, adviser and department chair must be obtained prior to registration for this course. A course designed to provide an opportunity for independent research in any area of biology outside the graduate student thesis area.

BIOL 693. Current Topics in Biology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. Designed to develop skills in preparing and delivering oral presentations in conjunction with an in-depth study of a current topic in biology. Students present talks and lead discussions on the selected topic.

BIOL 698. Thesis. 1-16 Hours.
Semester course; hours to be arranged. Credits to be arranged. Independent research by students in areas of systematics, environmental, developmental, behavioral, cellular and molecular biology, and comparative physiology.

Chemical Biology (CHEB)

CHEB 601. Chemical Biology I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the structure and function of biological macromolecules from a chemical biology perspective. The course will be divided into three sections -- nucleic acids, proteins and carbohydrates. Each section will initially focus on the thermodynamic properties of these macromolecules including the energetics of folding, thermodynamics of interactions and, for catalytic molecules, the kinetics of catalysis. Citing literature examples, the class will then focus on how small molecules have been used to uncover these properties.

CHEB 602. Chemical Biology II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on four broad areas of chemical biology: drug discovery (combinatorial chemistry, high throughput screening), natural product synthesis (combinatorial biochemistry), signal transduction (chemical genetics, pathway engineering) and protein translation (Phage display, in vitro translation/ sections). Each area will begin with a brief overview followed by several examples based on the current literature.

CHEB 690. Research Seminars in Chemical Biology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. Seminars presented by students, staff and visiting lecturers where current problems and developments in chemical biology are discussed. Graded as P/R.

CHEB 697. Chemical Biology Research Rotations. 1,2 Hour.
A research rotation laboratory course that gives students different experiences and allows them to choose a research supervisor. Students will learn the theory and practice of advanced chemical biology research methods in a research lab setting. Students will be mentored by a postgraduate student, postdoctoral fellow or technician. At the end of each rotation, the students will give a presentation on the laboratory work done at that time. The lab hours are a minimum of three hours per week to achieve significant experience, but it is expected that students will put in appropriate time to achieve meaningful results in the laboratory setting. Graded as S/U/F.

Chemistry (CHEM)

CHEM 504. Advanced Organic Chemistry I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An integrated study of certain free radical and ionic reaction mechanisms with emphasis on electronic effects and stereochemical consequences of these reactions.

CHEM 506. Introduction to Spectroscopic Methods in Organic Chemistry. 1.5 Hour.
Half-semester course; 3 lecture hours. 1.5 credits. Introduction to mass spectrometry, infrared and 1D 1H and 13C NMR spectroscopy, theory and practice in the elucidation of organic structures.

CHEM 507. Introduction to Natural Products. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the biosynthetic origins, isolation, structure elucidation and uses of naturally occurring organic compounds. Emphasis is placed upon three major classes of compounds, carboaromatics, terpenes and alkaloids.

CHEM 510. Atomic and Molecular Structure. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 301 and PHYS 208. Survey of the pertinent aspects of quantum mechanics. Line spectra, atomic structure and molecular bonding.

CHEM 511. Chemical Thermodynamics and Kinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The concepts and principles of thermodynamics and their application to chemical problems. The rates and mechanisms of chemical reactions including collision and transition state theories.

CHEM 512. Applied Molecular Modeling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Atomistic and coarse-grained force fields. Principles behind molecular simulations. Molecular dynamics and Monte Carlo approaches to problems in chemistry, molecular physics, biophysics and nanoscience. Thermodynamic and transport properties. Free energy calculations and rare event dynamics. Hands-on introduction to basic programming and operating systems. Suggested background: physical chemistry (CHEM 303) or thermodynamics with elements of statistical mechanics (PHYS 340, CHEM 511 or CHEM 612).

CHEM 532. Advanced Analytical Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theories and principles of thermodynamics and kinetics relevant to analytical methods, including acid-base, redox, and metal complexation equilibria, nonaqueous systems, kinetics and an introduction to surface chemistry.

CHEM 550. Introduction to Polymer Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of macromolecular compounds that includes classifications, methods of preparation, mechanisms, stereochemistry and applications. Physical characterizations, such as structure and property correlations, kinetics, thermodynamics, and molecular weight determinations are emphasized.

CHEM 580. Mechanical Properties of Plastics and Polymers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides a link between the more practical aspects of plastics and the fundamental properties of the polymers from which they are made. Topics covered deal with the structure of polymers with emphasis on relationships with mechanical properties; rubber elasticity; the glass transition and other secondary transitions; time and temperature dependency; yield and fracture; crystallization and morphology; influence of polymer processing on mechanical properties.

CHEM 591. Topics in Chemistry. 1-6 Hours.
Semester course; variable hours. 1-6 credits per semester. Maximum total of 9 credits for all topics courses. An in-depth study of a selected topic in chemistry. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

CHEM 604. Advanced Organic Chemistry II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An integrated study of the mechanism and stereochemistry of organic reactions and their application to organic synthesis. Emphasis is placed on addition and condensation reactions, carbanions, carbines, and other reactive intermediates.

CHEM 605. Physical Organic Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The theory and application of physical methods in the study of the behavior of organic compounds. Topics covered include homogeneous kinetics, equilibria, acid-base catalysis, and the quantitative correlation of structure and reactivity as they apply to the understanding of the mechanisms of organic reactions.

CHEM 606. Advanced Spectroscopic Methods in Organic Chemistry. 1.5 Hour.
Half-semester course; 3 lecture hours. 1.5 credits. Prerequisite: CHEM 506 or permission of instructor. Advanced spectroscopic techniques including 2-D, multinuclear and solid state NMR; theory and practice in the education of organic structures.

CHEM 610. Applied Quantum Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Quantum mechanics applied to chemical problems in UV, IR and NMR spectroscopy and the electronic structures of atoms and molecules; development of the self-consistent field equations. Suggested background: CHEM 510.

CHEM 611. Molecular Spectroscopy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course teaches the interaction of radiation and molecules; the rotation, vibration and electronic motion of molecules; molecular spectra and recent developments in laser spectroscopy. Suggested background: CHEM 510.

CHEM 612. Modern Statistical Mechanics: Fundamentals and Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Fundamental topics in modern equilibrium and non-equilibrium statistical mechanics, with applications to selected chemical, physical and biological systems. Suggested background: CHEM 510 and 511.

CHEM 615. Chemical Thermodynamics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The study of the laws of thermodynamics and their application to pure phases, solutions and changes in state.

CHEM 616. Chemical Kinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the rates and mechanisms of chemical reactions, reaction rate theory, kinetic theory of gases and theories of catalysis.

CHEM 620. Advanced Inorganic Chemistry I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The application of modern physical techniques for the determination of the symmetry, molecular structure, bonding and reaction mechanisms of inorganic compounds.

CHEM 621. Advanced Inorganic Chemistry II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. . A coordinated study of synthetic methods, stereochemistry and reaction mechanisms including catalysis of inorganic, organometallic and bioinorganic compounds. Suggested background: CHEM 620.

CHEM 622. Solid State and Materials Chemistry. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Prerequisite: CHEM 320. This course will present amorphous and crystalline solids, crystal structures, unit cells and packing, Miller indices, crystallographic directions and planes, crystal defects and non-stoichiometric compounds, phase diagrams and solid solutions, band structure and theory, sol-gel chemistry, powder X-ray diffraction, and X-ray crystallography.

CHEM 630. Electroanalytical Chemistry. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Presents the theory and application of electroanalytical techniques including cyclic voltammetry, potential step methods and microelectrode voltammetry. Suggested background: CHEM 409 or equivalent experience.

CHEM 631. Separation Science. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Students discuss theories and principles of separation science as applied to chemical problems with emphasis on current techniques, instrumentation and applications. Suggested background: CHEM 409 or equivalent experience.

CHEM 632. Chemometrics. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Computer methods for experimental design and data analysis of spectroscopic, electrochemical and chromatograph data. Topics include sampling theory, detection limits, curve resolution, Fourier transform-based instruments and factor analysis. Suggested background: CHEM 409 or equivalent experience.

CHEM 633. Mass Spectrometry. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Topics include mass spectrometry ionization methods, mass analyzers, theory and applications for ion structure determination. Suggested background: CHEM 409 or equivalent experience.

CHEM 634. Surface Science. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Topics include types of surfaces requiring surface analysis, electron-surface scattering (AES, UPS, XPS, HREELS, LEED, STM, SEM), photon-surface scattering (IR, NMR, EXAFS), molecule/ion-surface scattering (ISS, RMBS), chemisorption techniques and work function measurements. Suggested background: CHEM 409 or equivalent experience.

CHEM 635. Spectrochemical Analysis. 1.5 Hour.
Modular course; 3 lecture hours. 1.5 credits per module. Topics include instrumental components, such as lasers, photomultipliers, array detectors, monochromators, lock-in and boxcar detection, waveguides and optical fibers, atomic spectroscopic methods, fluorescence, Raman and circular dichroism spectroscopies. Suggested background: CHEM 409 or equivalent experience.

CHEM 636. Chemical Sensors and Biosensors. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Prerequisite: CHEM 409. The goal of this course is to teach “structure-function” relationships responsible for the analytical response of sensors and biosensors based on chemical transduction. The material covered is intended to provide a connection between the chemical structure of sensors and the transduction mechanisms that produce a response signal, as well as the physicochemical factors that affect performance. The content provided will be from different textbooks but complemented with illustrative examples from the research literature. Note: This is a half-semester course.

CHEM 637. Electrochemistry Applications. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. The goal of this course is to teach applications of electrochemistry in science and technology, thus complementing the principles covered in CHEM 630. The course content is intended to enhance understanding of the practical aspects of electrochemistry, so students can appreciate the impact of this field in the real world. General topics include energy conversion and storage, electrocatalysis, corrosion, electroplating, and concepts for simulating electrode processes. Note: This is a half-semester course.

CHEM 638. Scanning Electrochemical Microscopy. 3 Hours.
Semester course; 1 lecture and 3 laboratory hours. 3 credits. Prerequisite: CHEM 409. Scanning electrochemical microscopy is a scanning probe technique that generates topographic images of surfaces immersed in liquids. Besides imaging, SECM allows quantitative characterization of chemical processes between tip and the scanned surface including nonconducting ones, thus expanding its applicability to biological substrates. The course is structured around experiments that exemplify applications of SECM and allows experiential learning on the principles and measuring capabilities of SECM. Each lecture focuses on a particular experiment that can be performed in one or two lab sessions. The goal of the course is to provide an ecosystem of experimental methods that graduate students can directly apply in their research. The list of experiments covers topics in chemistry, biology and materials science.

CHEM 690. Research Seminar in Chemistry. 1 Hour.
Semester course; 2 lecture hours. 1 credit. May be repeated for credit. In addition to reports presented by students, staff and visiting lecturers, current problems and developments in nanoscience and nanotechnology are discussed. Graded S/U/F.

CHEM 691. Topics in Chemistry. 1-6 Hours.
Semester course; variable hours. 1-6 credits per semester. Maximum total of 9 credits for all topics courses. An advanced study of selected topic(s) in chemistry. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

CHEM 692. Chemistry Seminar Presentation. 1 Hour.
Semester course; 2 lecture hours. 1 credit. May be repeated for credit. In addition to reports presented by students, staff and visiting lecturers, current problems and developments in chemistry are discussed.

CHEM 693. Chemistry Perspectives and Ethics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. The objectives of this course are to prepare graduate students for a career in the physical sciences and develop graduate student competency in the responsible conduct of research from both ethical and safety standpoints. Graded as S/U/F.

CHEM 697. Directed Research. 1-15 Hours.
Semester course; 1-15 credits. May be repeated for credit. Research leading to the M.S. and Ph.D. degree.

CHEM 698. Investigations in Current Chemistry Literature. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit; a maximum of two credit hours may be presented toward the didactic course graduation requirements to count as one course. Interactive course designed to engage graduate students in current research topics of chemistry while developing skills for critical analysis of primary chemistry literature through oral presentations, group discussions or other formats. Students are expected to enroll in this course at least once before their literature seminar presentation (CHEM 692).

English (ENGL)

ENGL 500. Practicum in College English. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for credit. May not be applied toward degrees in English. Prerequisite: permission of director of graduate studies. Student participation in planned educational experience under the supervision of English department faculty. The practicum may include classroom teaching, Writing Center tutoring, or participation in research projects.

ENGL 501. Introduction to Graduate Studies in English. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Required of all new graduate students seeking the M.A. in English. An introduction to the theoretical and practical aspects of advanced English studies.

ENGL 528. Children's Literature II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of classic and current children's books from a variety of literary genres. Magazines and media-related reference resources and journals are reviewed. The creative use of literature, its sociocultural functions and its contribution to the development of the oral and written expression of children from nursery to grade eight are explored. A focus on children with special problems is included. May not be taken for credit toward undergraduate English major if student has taken ENGL 351/TEDU 351. May not be used to fulfill literature requirement for M.A. in English or M.F.A. in Creative Writing, but may be taken as elective credit. Crosslisted as: TEDU 528.

ENGL 532. Applied English Linguistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisite: ENGL 390. Application of linguistic theories and methods to selected teaching problems, such as teaching English grammar and usage, teaching English as a second or foreign language, or teaching standard English to students who speak different dialects. Crosslisted as: ENED 532.

ENGL 550. Studies in Linguistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisite: ENGL 390. A general introduction to one area of linguistic study, such as pronunciation, grammar, stylistics, dialects, usage standards, lexicography, onomastics or semantics.

ENGL 552. Teaching English as a Second Language. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students who plan to teach English to people whose native language is not English with a variety of instructional/learning strategies. Presents and explores current approaches and methodology, as these relate to linguistic features and pedagogy. Crosslisted as: TEDU 552/LING 552.

ENGL 560. Studies in British Literature and Culture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers important topics in British literary and cultural studies including major literary periods, genres, major authors or literary movements. May be repeated for credit with permission of the instructor.

ENGL 570. Special Topics in American Literature and Culture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers important topics in American literary and cultural studies including major literary periods, genres, authors and literary movements. May be repeated for credit with permission of instructor.

ENGL 601. Young Adult Literature. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of literature written for young adults, literature appropriate for young people in middle schools and high schools. Focuses on the content, characteristics and teaching of such literature. Crosslisted as: ENED 601.

ENGL 605. Introduction to Scholarship in English Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces the practice of research and scholarly discourse in English studies. Emphasizes scholarly resources (printed and electronic) and textual studies.

ENGL 606. Literary Criticism. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comparative study of critical approaches to literary texts (reader-oriented, new critical and formalist, psychoanalytic, archetypal, feminist and gender-oriented, structuralist, poststructuralist, new historicist and postcolonial). These approaches will be evaluated in terms of their capacity to address major components of the literary process (author, text, reader, history, culture); they will also be tested on selected literary texts. Some attention is given to the historical development of criticism, but the primary focus is on its theoretical claims, methodologies and aims.

ENGL 611. Authors. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study of the relationships among authorship (in material or discursive form), texts and cultural contexts.

ENGL 614. Cultural Discourses. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study of contemporary literary and nonliterary texts produced within a designated period of time.

ENGL 620. Intertextuality. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study of texts, potentially of disparate genres and contexts, focused on similar theme, concern or issue. Will examine both foundational, originating texts and subsequent reactions.

ENGL 624. Texts and Contexts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study of the ways in which texts shape, reflect and inform their cultural contexts.

ENGL 627. Genres. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A sustained and detailed examination of one or more genres.

ENGL 629. Form and Theory of Poetry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated once for credit. Will address a number of key issues concerning the structure of verse and the function of poetic discourse and will provide readers and writers of poetry an opportunity to study and practice a broad range of poetic forms and techniques, as well as to explore various genre conventions and their thematic and rhetorical significance. Students may study poems from various periods, with some focus on the contemporary, and apply to them the insights offered by major theorists of poetry and poetics. They also may write imitations, parodies and responses examining and demonstrating poetic approaches.

ENGL 630. Form and Theory of Fiction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated once for credit. Will address a number of key issues concerning the structure, conventions and function of narrative discourse and will seek to give readers and writers of fiction an opportunity to study a broad range of narrative forms, as well as to explore genre conventions and their thematic and rhetorical significance. Students will read stories and novels from various historical periods, with some focus on the contemporary, and apply to them the insights offered by major theorists of narrative. They also may write imitations, parodies and responses examining and demonstrating the aesthetics of fiction.

ENGL 631. Form and Theory of Creative Nonfiction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated once for credit. Will address a number of key issues concerning the structure, conventions and function of varied types of creative nonfiction and will seek to give readers and writers an opportunity to study a broad range of forms in the genre, which may include magazine articles, research-based reportage, New Journalism, memoir, biography, autobiography, the meditative essay, the personal essay, the lyric essay and others, as well as to explore genre conventions and their thematic and rhetorical significance. Students will read across this range of forms, with some focus on contemporary writing, and apply to them insights offered by major theorists of the genre. They also may write imitations, parodies and responses examining and demonstrating the aesthetics of creative nonfiction writing.

ENGL 632. Community Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course teaches students how to use research in rhetoric and composition to design and deliver a community writing project that is mutually empowering, knowledge generating and publicly oriented -- designed to inspire social change.

ENGL 636. Teaching Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines theories and practices of teaching writing, with emphasis on the connections between theory and practice. Crosslisted as: ENED 636.

ENGL 637. Theories of Rhetoric and Composition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ENGL 636. A study of theory and scholarship in rhetoric and writing.

ENGL 638. Responding to Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course studies theories and practices for responding to expository and persuasive nonfiction texts, both students' and professionals', academic and creative.

ENGL 652. Studies in Writing and Rhetoric: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study of an area or specialized issue in rhetoric and/or writing such as the history of rhetoric, theories of invention, qualitative research methods in writing, or studies in style.

ENGL 661. Themes in Interdisciplinary Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A study in depth of a theme, topic, or concept involving two or more disciplines.

ENGL 666. Creative Writing: Fiction. 3 Hours.
Semester course; 3 workshop hours. 3 credits. May be repeated for credit. Prerequisite: graduate standing in M.F.A. program or permission of the Creative Writing Committee. All students seeking to enroll must contact the creative writing M.F.A. director. Study of the art of fiction writing, with the goal of producing professionally acceptable and publishable fiction. Workshop members shall produce a substantial amount of writing, short stories or a portion of a novel, and in addition shall be able to evaluate and articulate the strengths of their own work. Graded as pass/fail.

ENGL 667. Creating Writing: Poetry. 3 Hours.
Semester course; 3 workshop hours. 3 credits. May be repeated for credit. Prerequisite: graduate standing in M.F.A. program or permission of the Creative Writing Committee. All students seeking to enroll must contact the creative writing M.F.A. director. Study of the art of poetry writing, with the goal of producing professionally acceptable and publishable poetry. Workshop members shall produce a substantial amount of poetry and in addition shall be able to evaluate and articulate the strengths of their own work. Graded as pass/fail.

ENGL 668. Creative Writing: Drama. 3 Hours.
Semester course; 3 workshop hours. 3 credits. May be repeated for credit. Prerequisite: graduate standing in M.F.A. program or permission of the Creative Writing Committee. All students seeking to enroll must contact the creative writing M.F.A. director. Study of the art of playwriting with the goal of creating plays that are suitable for production. Workshop members shall produce a substantial volume of writing, one-act plays, or a portion of a longer play, and, in addition, shall be able to evaluate and articulate the strengths of their own work. Graded as pass/fail.

ENGL 670. Literary Editing and Publishing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. A course in which the student learns to edit fiction, poetry, drama, or nonfiction. Genre covered will vary from semester to semester. Attention will be paid to the ways in which editors work with writers in all the technical aspects of editing, revising and publishing. Ethical responsibilities of editors to authors and their texts will be stressed. Questions considering the publishing world at large will be considered.

ENGL 671. Film and Television Scripts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of the theory and practice of producing shooting scripts for television and motion pictures. Emphasis will be placed on the various kinds of scripts most commonly used by directors and cinematographers (e.g., silent, narrated and dramatized). Attention will also be paid to the ways in which script writers adapt material to audiences, and the ways in which strict time frames are imposed on scripts. Students will write scripts of various kinds and lengths.

ENGL 672. Writing Nonfiction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisite: permission of instructor. Study and practice of writing one or more modes of nonfiction on the professional or preprofessional level, under critical supervision. Emphasis will be placed on such matters as organization, style, revision, and adaptation to particular audiences and publications. Possible kinds of writing could include reports; writing based on statistics; writing textbooks; writing separate chapters of books, and writing reviews, criticism and advocacy materials.

ENGL 673. Teaching Creative Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course is intended for those who teach or plan to teach creative writing. A comparative analysis of different approaches to the teaching of creative writing. Attention will be paid to the different ways in which elements such as dialogue, sound pattern, scene development, line break, meter, voice and distance can be taught.

ENGL 692. Independent Study. 1-3 Hours.
1-3 hours. Variable credit. Maximum of 6 credits. Prerequisite: permission from department chair. For students in English/English education to pursue, in depth, a particular problem or topic about which an interest or talent has been demonstrated.

ENGL 694. Internship in Writing. 3 Hours.
Semester course; 1 lecture and 6 practicum hours. 3 credits. Permission of director of M.A. program required. Analyses and practices of professional writing in settings such as business, government and industry.

ENGL 695. Directed Study/Major Project and Presentation. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May not be repeated for credit. Students who choose not to write a thesis will complete a substantial project with a graduate faculty adviser and share the results of his or her research in a public presentation. This project may be an expansion or reworking of a seminar paper or group of seminar papers and must contain a statement of the theoretical, critical or methodological issues important to the project. An abstract of the research will be submitted three to four weeks before the presentation date scheduled for that semester and must be approved by the M.A. committee. The presentation will take place before the adviser, M.A. committee members, and interested faculty and students on the date designated by the M.A. director. Graded PR. Note: Students who present a paper at a national conference or publish in a reputable journal may be exempted from the presentation upon the approval of the M.A. committee.

ENGL 798. Thesis. 1-3 Hours.
Continuous courses; hours to be arranged. Credits to be arranged; 1-3 credits per course. Preparation of a thesis or project based on independent research or study and supervised by a graduate adviser.

ENGL 799. Thesis. 1-3 Hours.
Continuous courses; hours to be arranged. Credits to be arranged; 1-3 credits per course. Preparation of a thesis or project based on independent research or study and supervised by a graduate adviser.

Foreign Languages (FRLG)

FRLG 510. Language Learning and Technology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces the variety of ways technology can be used to enhance language instruction and student learning. Targeted technologies include audio/visual media, language learning software, the Internet and multimedia resources. Attention also will be given to considerations of learning style, curricular integration and enhancement.

FRLG 575. Intercultural Communication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An experientially oriented seminar for persons preparing for or in careers necessitating intercultural communication among persons of differing cultural and/or national backgrounds. Special attention is given to teachers and other professionals who work with a clientele from Latin America, the Middle East, Asia, Africa and Eastern Europe. American cultural patterns broaden understanding of specific groups and engagement in intercultural communication. Crosslisted as: TEDU 575.

FRLG 591. Topics in Foreign Languages. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. A detailed study of selected topics in one or more of the foreign language or comparative courses offered by the department.

Forensic Science (FRSC)

FRSC 505. Forensic Entomology. 3 Hours.
Semester course; 3 lecture and 1 laboratory hour. 3 credits. Enrollment requires permission of instructor. Course focuses on proper collection, preservation and identification of entomological evidence. Students collect entomological evidence from a mock crime scene and utilize these specimens for estimation of minimum postmortem interval. There is a significant laboratory component.

FRSC 510. Developmental Osteology. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: FRSC 300; ANTH 307 and ANTZ 307; ANTH 310; graduate standing in forensic science; or permission of instructor. Examines the human musculoskeletal system and its development from an embryonic state to the adult form. Students learn the developmental course of each bone in the human skeleton and those of the associated soft tissue structures. Students are provided with training in the recognition of skeletal elements and bony landmarks, siding skeletal elements (and fragments thereof), knowledge of muscle structure and function and knowledge of nervous and venous structures associated with bony landmarks. Developmental defects and trauma associated with birth and child abuse are discussed. Juvenile age estimation from bones and radiographic images are emphasized.

FRSC 515. Advanced Forensic Anthropology. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: FRSC 510; ANTH 307 and ANTZ 307; or permission of instructor. Focuses on estimation of the biological profile, statistical basis of estimations, pathological conditions, analysis of antemortem and perimortem trauma, human identification in mass casualty situations, age estimation of living individuals and writing of case reports. Techniques discussed will include macroscopic and microscopic analysis of morphology, histological analysis, radiographs and CT scans. There is a significant laboratory component.

FRSC 520. Forensic Fire Investigation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FRSC 375 with a minimum grade of C (for undergraduate students), FRSC 670 or equivalent. Examines the specialized field of forensic fire investigation including on-scene investigation, fire theory, accelerant-assisted burn patterns and expert-witness testimony.

FRSC 565. Scientific Crime Scene Investigation. 3 Hours.
Semester course; 3 lecture and/or laboratory hours. 3 credits. Presents the theory and techniques of scientific crime scene investigation including: recognition, documentation, collection and enhancement of physical evidence. A comprehensive introduction to the use of physical evidence for crime scene reconstruction is presented.

FRSC 566. Advanced Crime Scene Investigation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FRSC 309 with a minimum grade of C (for undergraduate students), FRSC 565 or equivalent. An advanced study of the methods and techniques of crime scene investigation with an emphasis on crime scene reconstruction by the use of physical evidence. Course will include extensive practical applications with mock crime scenes.

FRSC 570. Forensic Science Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for a maximum of 3 credits. A seminar course featuring presentations by faculty, crime laboratory staff, students and visiting lecturers. Instruction includes discussions of research and developments and current topics in various forensic science disciplines and related fields. Graded as S/U.

FRSC 580. Applied Statistics for Forensic Science. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 210, STAT 212 or equivalent statistics knowledge; or graduate standing in forensic science. The course will focus on the forensic applications of data visualization methods, hypothesis testing, analysis of variance, correlation measures, regression, multivariate analyses and concepts in database "matching" procedures. Techniques discussed will include ANOVA, MANOVA, principal component analysis, non-metric multidimensional scaling, discriminant function analysis and machine learning/neural network analysis.

FRSC 591. Topics in Forensic Science. 1-3 Hours.
Semester course; variable lecture hours. 1-3 credits; maximum of 6 credits for all forensic science topic courses may be applied to major. Prerequisite: graduate standing in the forensic science program or permission of instructor required for enrollment. A study in selected topics in forensic science. See the Schedule of Classes for specific topics to be offered each semester and additional prerequisites.

FRSC 607. Forensic Taphonomy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the process and sequence of human decomposition, as well as the burial, water disposal and surface dispersal of human remains. The course covers current issues in taphonomic research and practical application, including both domestic and international examples of mass disasters and mass graves. An understanding of the principles of archaeological stratigraphy is an integral part of the course. There is a significant laboratory component.

FRSC 644. Forensic Toxicology. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Lecture and demonstrations in which common poisons and groups of poisons are discussed as to detection, diagnosis and treatment of poisoning. Demonstrations include basic principles of analytical toxicology, forensic science and courtroom testimony. Crosslisted as: PHTX 644.

FRSC 661. Analysis of Pattern Evidence. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Prerequisites: FRSC 673 and FRSZ 673 or equivalents. Covers topics in pattern evidence analysis including analysis of latent prints and other patterned evidence as applied to forensic casework. The course covers both the theoretical and practical aspects, using lectures and laboratory exercises focusing on the collection, analysis and interpretation of pattern evidence.

FRSC 662. Firearm and Toolmark Identification. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Prerequisites: FRSC 673 and FRSZ 673L or equivalents. Covers topics in firearm and toolmark identification as applied to forensic casework. The course covers both the theoretical and practical aspects, using lectures and laboratory exercises.

FRSC 663. Forensic Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the fundamentals of forensic medicine including topics such as forensic death investigations, postmortem changes, time-of-death determinations, identification of unknown human remains and the forensic pathology of natural and traumatic deaths in adults and children. The characteristics and diagnosis of various types of trauma as well as the characteristics of common natural diseases that cause sudden death will be presented.

FRSC 670. Forensic Evidence and Criminal Procedure. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents the law of criminal procedure and rules of evidence as applied to forensic science. Explores issues of scientific versus legal burdens of proof, legal terminology and trial procedure.

FRSC 671. Instrumentation in Forensic Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and applications of chromatography, mass spectrometry and spectroscopy as used in modern crime laboratories. Instruction will focus on instrumental analysis as applied to drug analysis, toxicology, fire debris identification and general trace evidence examination.

FRSC 672. Advanced Drug Analysis. 3 Hours.
Semester course; 3 lecture and/or laboratory hours. 3 credits. Isolation and identification of abused drugs emphasizing the analysis of unknowns, problems encountered in analysis and chain of custody issues.

FRSC 673. Forensic Microscopy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Establishes the foundation for the theory of microscopy. The knowledge acquired in this course can be applied to forensic disciplines such as firearms examinations, forensic biology, controlled substances, questioned documents and trace evidence.

FRSC 675. Forensic Serology and DNA Analysis. 2 Hours.
Semester course; 2 lecture and/or laboratory hours. 2 credits. Presents the theory and methodology used for the examination and identification of body fluid stains and determination of species. Provides students an introduction to the theory and methodology of forensic DNA analysis as well as forensic DNA quality control issues. Instruction will focus on molecular biology techniques as they are applied in a forensic DNA crime laboratory setting.

FRSC 676. Advanced Forensic DNA Analysis. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Focuses on the specific principles and modern procedures used for analysis of forensic nuclear and mitochondrial DNA evidence. Other topics include current research and development for forensic DNA instrumentation and applications, statistical interpretation of results and case report writing. Students gain individualized, hands-on experience with DNA procedures and instrumentation in the laboratory exercises. Students will process mock forensic casework.

FRSC 677. Professional Practices and Expert Testimony. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: must have successfully completed a minimum of 18 credit hours in the forensic science master's degree program. Topics related to professional practices in the forensic science field will be covered, including ethics, bias, quality assurance, laboratory management and professional development. Individual and group activities relating to these topics will be completed. Additionally, this course will examine forensic expert testimony in the courtroom, communication of scientific findings to a general audience, trial preparation and cross-examination in moot court format.

FRSC 680. Forensic Psychiatry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Guilty mind requirements in criminal law. Competency to stand trial, insanity defense, mental disorder and crime. Behavioral profiling of serial murders and sex offenders. Issues in the use of clinical and statistical prediction methods in criminal justice. Crosslisted as: CRJS 680.

FRSC 681. Analysis of Fire Debris and Explosives. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Prerequisites: FRSC 671, FRSC 673 and FRSZ 673L or equivalents. Presents the collection, analysis and interpretation of fire debris and explosives as they are applied in forensic casework. Covers the theoretical and practical aspects. Laboratory exercises include hands-on instruction with appropriate instrumentation and techniques, including stereomicroscopy, gas chromatography, GC-MS, thin layer chromatography, HPLC and FT-IR.

FRSC 682. Forensic Analysis of Paint and Polymers. 3 Hours.
Semester course; 5 lecture/laboratory hours. 3 credits. Prerequisites: FRSC 671, FRSC 673 and FRSZ 673L or equivalents. Covers topics in paint and polymer analysis including collection, classification and analysis of paint and fiber evidence as applied to forensic casework. The course covers the theoretical and practical aspects, using lectures and laboratory exercises. Laboratory exercises include hands-on instruction with appropriate instrumentation and techniques, including stereomicroscopy, microchemical testing, fluorescence molecular tomography, fluorescence microscopy, FT-IR and polarizing light microscopy.

FRSC 686. Emerging Molecular Applications for Forensic Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FRSC 676. Emerging forensic molecular technologies as well as molecular applications for nontraditional forensic needs will be covered. Emphasis will be given to current research and to technologies most likely to be implemented in forensic laboratories. Molecular applications may include those that involve analysis of DNA, RNA, protein, or other cell macromolecules and/or those that use advanced molecular tools for separation, detection, manipulation, identification, imaging and analysis. Students gain individualized experience in literature research, in summarization/simplification of technical information and in oral presentation.

FRSC 690. Scientific Writing. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to students in the M.S. in Forensic Science program. Focuses on scientific writing techniques, including abstracts, posters, review articles and research proposals. Emphasis will be placed on writing for scientific journals in forensic science and other peer-reviewed journals.

FRSC 692. Forensic Science Independent Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Maximum credit for all independent study applicable to degree is 6 credits. The amount of credit must be determined, and written permission of instructor and program director must be obtained prior to registration. This course is designed to provide an opportunity for independent laboratory research in an area of forensic science or related scientific discipline. The end products of this experience will include an oral presentation at a campus seminar and a written report.

FRSC 693. Current Topics in Forensic Science. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. A course designed to develop skills in reading journal manuscripts and delivering oral presentations in conjunction with an in-depth study of a current topic in forensic science. Student will conduct library research, present talks and lead discussions on the selected topic. See the Schedule of Classes for specific current topics course to be offered each semester and prerequisites.

FRSC 792. Research Techniques. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Enrollment restricted to students with graduate standing in forensic sciences and with permission of faculty mentor. Application of basic laboratory methods used in forensic science to the investigation of topics of interest. Emphasis on experimental design, data collection and analysis, communication skills, and critical thinking. Graded as Satisfactory/Unsatisfactory.

FRSC 793. Directed Research in Forensic Science. 1-3 Hours.
Semester course; 1-3 practicum hours. 1-3 credits. May be repeated for credit with up to 6 credits counted toward the degree requirements. Enrollment restricted to students in the forensic science master's degree program with permission of the instructor. A capstone course in which students will conduct independent, original laboratory research in a forensic specialization area of interest, while also gaining practical experience in crime laboratory practices and methods. A minimum of 300 hours of laboratory research and a minimum of three credits are required for graduation.

Forensic Science Lab (FRSZ)

FRSZ 673. Forensic Microscopy Laboratory. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Establishes the foundation for the application and methodology of microscopy. The knowledge acquired in this course can be applied to forensic disciplines such as firearms examinations, forensic biology, controlled substances, questioned documents and trace evidence. The course consists of laboratory exercises and demonstrations.

FRSZ 675. Forensic Serology and DNA Analysis Laboratory. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Presents the chemical, immunological and microscopic laboratory techniques commonly used for the examination and identification of body fluid stains and determination of species. Provides working knowledge and hands-on practice with basic forensic DNA procedures, including DNA extractions, quantitation, PCR amplification analysis/genotyping. Instruction focuses on molecular biology techniques as applied in a forensic DNA laboratory.

FRSZ 792. Research Techniques. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Enrollment restricted to students with graduate standing in forensic science and permission of faculty mentor. Application of basic laboratory methods used in forensic science to the investigation of topics of interest. Emphasis on experimental design, data collection and analysis, communication skills, and critical thinking. Graded as Pass/Fail.

French (FREN)

FREN 500. French for Graduate Students. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to prepare graduate students for the reading knowledge examination for higher degrees. Each graduate department will determine the nature and form of certifying examination.

FREN 501. French Communication. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. An intensive study of communication in French. Variable credits; primarily oral, written and listening skills.

FREN 511. French Civilization. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Prerequisite: functional fluency in French since the class will be taught in French. A comprehensive study of the civilization and culture of France and its global expressions.

Gender, Sexuality and Women's Studies (GSWS)

GSWS 501. Feminist Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar provides an overview of the theories of feminisms.

GSWS 602. Feminist Research Epistemology and Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course explores the implications of feminist theorizing across disciplinary and cultural contexts for both epistemology (theories of knowledge) and methods (theories and approaches in the research process). Students will examine how knowledge and power intersect, how gender theory and feminist politics influence research, how the knower influences knowledge production and how social location shapes inquiry. Students will experiment with feminist methods and approaches to researching issues related to gender, sexuality and women, and ethical considerations as these issues affect vulnerable populations.

GSWS 620. Theorizing Sexuality. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course examines and explores constructions of human sexuality (sexualities) and theorizes how these constructions operate within contemporary culture.

GSWS 622. Women and Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar differentiates theories of feminisms and explores the effects of polices, or their absence, for women in the U.S., briefly examining theories of policymaking and the policy process in relation to feminist theories and the feminist project.

GSWS 624. Gender and Cultural Production. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar takes as a starting point an understanding of culture as the expressive practice of meaning making that lies at the intersection of art, imagination, technology, space and politics.

GSWS 691. Topics in Gender, Sexuality and Women's Studies. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Course may be repeated with different topics as approved. Prerequisite: permission of instructor. An in-depth study of a selected topic in gender, sexuality and/or women's studies. See Schedule of Classes for specific topics to be offered each semester.

GSWS 692. Independent Study. 1-4 Hours.
Semester course; variable hours, variable credit. Maximum 4 credits per semester. Maximum total of 4 credits in all independent study courses. Prerequisites: completion of 6 credits in gender, sexuality and women's studies courses.

German (GRMN)

GRMN 500. German for Graduate Students. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to prepare graduate students for the reading knowledge examination for higher degrees. Each graduate department will determine the nature and form of the certifying examination.

GRMN 502. German Communication. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. An intensive study of communication in German. The content of this course will emphasize primarily oral, written and listening skills.

GRMN 512. German Civilization. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Prerequisite: functional fluency in German since the class will be taught in German. A comprehensive study of the civilization and culture of Germany and its global expressions.

Health and Movement Sciences (HEMS)

HEMS 500. Motor Development of Young Children. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the development of small children, preschool, kindergarten and first-grade children through physical education. Emphasis will be on the construction of a program of motor development for each of these three groups. The programs will be based on the research findings in such areas as perceptual-motor development, motor learning, educational psychology and others. Those students and teachers in the fields of physical education, special education and elementary education should find this course useful in developing programs of motor development for their students.

HEMS 505. Contemporary Issues in Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on contemporary issues related to lifestyle and health behavior. Emphasizes the factors that influence health and the lifestyle changes that promote and maintain optimal health. Issues may include sexuality, nutrition, chronic and communicable diseases, aging, environmental health, policy, and health care systems.

HEMS 507. Teaching Health in Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines health issues, family influences, teenage attitudes and signs of progress in health behavior. School health programs, including remedial, classroom instruction and environmental aspects of school life also are considered.

HEMS 514. Physical Activity for Special Populations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides fundamental information to students at the graduate level on physical activity programming for children with disabilities. Course content focuses on programming techniques and methods that are most effective in meeting the specific physical activity needs of the individual child. Emphasis is on Public Law 94-142 provisions currently affecting physical education programming for special populations; in particular, the development of specially designed physical education programs, individualized education programs and programming in the least restrictive environment.

HEMS 521. Pathomechanics of Sport Injuries. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Addresses musculoskeletal and sports injury mechanisms from a pathomechanical and pathophysiological perspective. Focuses on acute trauma and repetitive stress injuries to the musculoskeletal system. Emphasizes evaluation and diagnostic procedures and the pathophysiology and evaluation of mild head injuries commonly acquired as part of physical activity.

HEMS 550. Exercise, Nutrition and Weight Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an in-depth analysis of the scientific principles associated with weight management strategies. Emphasizes the separate and combined effects of exercise, nutrition and behavioral interventions relative to weight loss, weight gain and weight maintenance. Includes life cycle nutrition, childhood obesity, adult obesity and chronic disease, weight management intervention strategies, eating disordered behavior and the female athlete triad.

HEMS 591. Topical Seminar. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. A seminar intended for group study by students interested in examining topics, issues or problems related to health, physical education, exercise science, recreation and sport. Crosslisted as: SPTL 591.

HEMS 600. Introduction to Research Design in Health and Movement Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an understanding of the basic knowledge and methodology of research in health and movement sciences. Develops the ability to critically read and evaluate research, acquire a conceptual understanding of statistics and develop an empirical study related to healthy and diseased populations.

HEMS 601. Movement Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HPEX 375 or equivalent. Investigates the physiological processes in relation to bodily exercises in everyday life and sports activities. Physiological changes in the human organism due to movement. Investigation and application of research to health and movement sciences. Students must design, conduct and write a pilot study.

HEMS 602. Statistical Applications in Health and Movement Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents theory and techniques involved in the analysis and interpretation of data pertinent to research in health and movement sciences. Includes statistics applied to data encountered in published health and movement sciences research.

HEMS 603. Applied Fitness and Nutrition for Health and Movement Science Professionals. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An in-depth study of applied fitness and nutrition principles and practices. Emphasizes the application of knowledge and fundamental fitness and nutrition principles.

HEMS 604. Nutrition for Health and Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HPEX 350 or equivalent. Provides an in-depth examination of the basic nutrients and their effects on health, fitness and sport performance. Emphasizes an understanding of the biochemistry of metabolism and knowledge of the current research related to nutrition, health and exercise performance.

HEMS 605. Psychology of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Introductory psychology, personal health or equivalent. Examines psychological issues related to exercise and physical activity. Includes individual and group motivation theory and techniques, leadership effectiveness, mental health, mental skills training, injury rehabilitation, eating disorders, exercise adherence, addiction, over training and use of ergogenic aids. Emphasizes examining current research and applications of psychological principles and knowledge in a physical activity setting.

HEMS 606. Psychosocial Aspects of Sport and Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines social and psychological issues in sport and physical activity, with emphasis on socialization and motivation for sport and physical activity; patterns of participation and opportunities related to race, gender and social class; mental skills training for performance enhancement; aggression and violence in sport and society; and the role of sport and physical activity in the educational system. Emphasizes examining current research and applied methods in addressing these issues.

HEMS 610. Laboratory Techniques in Rehabilitation Science. 3 Hours.
Semester course; 3 hours. 3 credits. Prerequisite: HPEX 375 or equivalent. Laboratory-based course examining the various procedures related to measurement and experimentation in human performance. Includes examination of instruments designed to assess cardiovascular, musculoskeletal and pulmonary performance. Emphasis is given to application of instrumentation to physical training in healthy and diseased populations and to treatment and rehabilitation in a clinical setting.

HEMS 612. Administration and Supervision of Physical Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Gives guidelines for administrative and supervisory policies and problems in physical education and explores observation techniques, standards for judging instruction, the supervisory conference and cooperative supervision. Emphasis is placed upon the common problems met by administrators and supervisors.

HEMS 613. General Motor Ability Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Investigates the theory of the construction of evaluative instruments in physical education with emphasis on a critical examination of existing measurement devices. Emphasis on the use of measurement as a tool for improving physical education programs.

HEMS 614. Motor Assessment for Special Populations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HEMS 514 or permission of instructor. Provides the student with basic information regarding motor tests and observational instruments that assess and evaluate special populations. Focuses on the analysis of these tests as to their 1) main components and items purporting to measure these components; 2) administration, i.e., time, administrator's experience, group size, validity and reliability and standardization; and 3) use in establishing and monitoring annual goals and short-term objectives for an individualized education program.

HEMS 615. Orthopaedics and Therapeutics in Sports Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides in-depth exposure to procedures used in orthopaedics and physical medicine. Includes lectures and presentations by physicians, surgeons and other health care personnel. Focuses on linking diagnostic and surgical techniques used in orthopaedics and physical medicine to the rehabilitative treatment plan. Emphasizes the diagnosis and treatment of neuromuscular diseases and adaptive technologies for disabled populations.

HEMS 620. Motor Learning and Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analysis of early patterns of behavior and the development of physical skills in childhood, adolescence, and adulthood. Consideration of differences in motor proficiency and factors affecting the acquisition of motor skills and concepts of motor learning with reference to the improvement of instructional practices.

HEMS 621. Sports Medicine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HEMS 521 or permission of instructor. Designed to give the student knowledge in the advanced principles of prevention and treatment of athletic injuries. The course includes advanced first aid techniques and the more sophisticated means of athletic care and prevention. Students are exposed to such modalities as mechanical therapies, thermal therapy, cryotherapy, hydrotherapy and electrotherapy. One major component of the course deals with therapeutic exercise and its use in the rehabilitation of the injured athlete.

HEMS 637. Advanced Technology in Teaching Health and Physical Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to prepare students to apply knowledge and skills in using technology in the physical education setting. Emphasis is placed on creating lessons using pedometers, downloadable heart-rate monitors, flip cams, computerized observational systems and the pocket PC. Focus is also on the use of local county grade-reporting systems.

HEMS 640. Health Care Organization and Delivery in the U.S.. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the U.S. health care system and its many diverse components. Within the context of the U.S. health system, the course also provides students a perspective on the growing role of health behavior coaches as part of the interdisciplinary health team, the variety of employment opportunities and the business development potential of the field.

HEMS 641. Human Disease Prevention, Prevalence and Lifestyle Risk Factors. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines major categories of diseases, i.e., infectious, noninfectious, acute and chronic, including significant examples in each category. Current modalities for the prevention, treatment and control of diseases will be studied. In addition, the course will provide learning experiences to prepare students to convey information as health behavior coaches to a variety of audiences, including individual patients/clients, groups, specific priority populations and the general public.

HEMS 642. Theoretical Foundations of Health Behavior Change. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Investigates the relationship between health and behavior, with emphasis on both theory and application. The course addresses the theoretical foundations of behavior change, including an overview of leading theories as well as critical evaluation of their utility in promoting health behavior change.

HEMS 643. Fundamentals of Motivational Interviewing. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Restricted to health behavior coaching certificate students only. Introduces students to the fundamentals of motivational interviewing, a state-of-the-art, evidence-based communication and counseling technique. MI is designed to build clients' and patients' inner motivation and self-efficacy for positive health behavior change and maintenance. This course will expose students to the theory, principles and skills of MI that can be utilized with individuals or with groups.

HEMS 644. Advanced Motivational Interviewing. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: HEMS 643. Expands the students' exposure, understanding and practice of motivational interviewing, a state-of-the-art, evidence-based communication and counseling technique. MI is designed to build clients' and patients' inner motivation and self-efficacy for positive health behavior change and maintenance. This course will reiterate the importance of the theoretical foundation underlying MI, examine applications of MI and provide opportunities for advancing students' skills through role-playing specific to health behavior change.

HEMS 645. Application of Motivational Interviewing in Clinical Settings. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisites: HEMS 644, HEMS 647 and HEMS 648. Expands the student's knowledge, skills and competencies in motivational interviewing by focusing on the utilization of this communication and counseling technique in clinical settings (i.e., health/medical care settings). Students will be exposed to applications of MI that can be employed with individual patients or clients who present with single disease processes or comorbidities.

HEMS 646. Application of Motivational Interviewing in Group and Community Settings. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisites: HEMS 644, HEMS 647, HEMS 649. Expands the student's knowledge, skills and competencies in motivational interviewing by focusing on the utilization of this communication and counseling technique in group or community settings (e.g., support groups, groups in community organizations, groups in faith-based organizations, etc.). Students will be exposed to applications of MI that can be employed with groups who present with common health challenges or groups who are concerned with health promotion and disease prevention.

HEMS 647. Concepts and Applications in Chronic Disease Self-management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HEMS 640, HEMS 641, HEMS 642 and HEMS 643. Evidence-based course designed to enhance the student's knowledge of lifestyle factors such as physical activity, nutrition, weight management, stress management, medication compliance and tobacco cessation, etc., as they relate to the self-management of the most prevalent chronic diseases that affect the U.S. Students will learn hands-on skills to assist patients/clients across the lifespan.

HEMS 648. Health Behavior Change Counseling Techniques for Clinical Interventions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HEMS 640, HEMS 641, HEMS 642, HEMS 643. Focuses on the development of knowledge and skills that are essential to effective interpersonal communication and counseling, which will lay the foundation for effective health behavior coaching. Emphasis will be placed on fundamental counseling techniques and motivational interviewing and their applications to individual level health behavior change.

HEMS 649. Planning, Implementing and Evaluating Group/Community Health Behavior Change Interventions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HEMS 640, HEMS641, HEMS 642 and HEMS 643. Addresses the fundamentals of planning, implementing and evaluating health behavior change interventions in a variety of group or community settings, including support groups, worksite health promotion groups, community groups, faith-based groups, etc. Students will operationalize and apply the knowledge and skills essential to the effective practice of certified health behavior coaches.

HEMS 675. Clinical Exercise Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Permission of instructor. Examines theoretical and functional techniques of graded exercise testing for functional and/or diagnostic assessment. Topics include pulmonary, cardiovascular, respiratory and myocardial physiology, and the principles and skills of exercise prescription based on metabolic calculations.

HEMS 690. Research Seminar in Health and Movement Sciences. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 3 credits. Provides opportunities for presentation and discussion of current research and topics of interest in health and movement sciences. Presents relevant research for discussion delivered by guest researchers, faculty and students.

HEMS 691. Topics in Health and Movement Sciences. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for 9 credits. Check with division head for specific prerequisites. Examines specialized issues, topics, readings or problems in health and movement sciences.

HEMS 692. Independent Study. 1-3 Hours.
Semester course; 1-3 hours. 1-3 credits. May be repeated for 6 credits. Determination of the amount of credit and permission of the instructor and division head must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in health or movement sciences. Crosslisted as: REMS 692.

HEMS 695. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for 6 credits. Prerequisite: Permission of instructor. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies in health and movement sciences. Directed by university faculty in cooperation with clinical on-site supervisors.

HEMS 797. Directed Research Study. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 6 credits. A research study of a topic or problem approved by the student's adviser and completed in accordance with division policy regarding the directed research study.

HEMS 798. Thesis. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 6 credits. A research study of a topic or problem approved by the student's supervisory committee and completed in accordance with acceptable standards for thesis writing.

History (HIST)

HIST 511. Studies in American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Study of a selected topic in American history, primarily through lectures and readings. See the Schedule of Classes for specific topics to be offered each semester.

HIST 515. Studies in European History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Study of a selected topic in European history, primarily through lectures and readings. See the Schedule of Classes for specific topics to be offered each semester.

HIST 519. Studies in Ethnic and Social History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Study of a selected topic in ethnic or social history, primarily through lectures and readings. See the Schedule of Classes for specific topics to be offered each semester.

HIST 523. Studies in Virginia and Southern History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Study of a selected topic in Virginia or Southern history, primarily through lectures and readings. See the Schedule of Classes for specific topics to be offered each semester.

HIST 527. Studies in African-American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Study of a selected topic in African-American history, primarily through lectures and readings. See the Schedule of Classes for specific topics to be offered each semester.

HIST 591. Special Topics in History. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated with different topics for a maximum of 9 credits. An intensive study of a selected topic in history.

HIST 601. Historiography and Methodology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the development of history as a discipline from ancient times to the present. The course examines the evolution of historical theory and philosophy, great historians, schools of interpretation, and problems of historical methodology. This course is a prerequisite for research seminars.

HIST 611. Readings in American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of American history through readings and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 615. Readings in European History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of European history through readings and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 618. Readings in Transatlantic History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of transatlantic history through reading and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 619. Readings in Ethnic and Social History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of ethnic or social history through readings and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 623. Readings in Virginia and Southern History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of Virginia or Southern history through readings and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 627. Readings in African-American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of major studies and interpretative trends in a particular area of African-American history through readings and class discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 631. Research in American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of American history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 635. Research in European History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of European history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 638. Research in Transatlantic History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of transatlantic history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 639. Research in Ethnic and Social History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of ethnic or social history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 643. Research in Virginia and Southern History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of Virginia or Southern history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 647. Research in African-American History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. Analysis of significant problems in a particular field of African-American history through research, writing, in-class presentations and discussions. See the Schedule of Classes for specific topics to be offered each semester.

HIST 651. Public History: Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of the field of public history, intended to introduce students to the range of professional historical activities practiced outside the classroom. Explores methods and skills including archival work, documentary editing, historic preservation, museum studies and oral history. The course also involves a sustained consideration of the theoretical issues that arise from public history work, defined as history of, for, by and/or with the public.

HIST 652. Documentary Editing and Scholarly Publishing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of the processes by which historical scholarship is disseminated by publication. Students will practice editing scholarly editions of historic documents and reviewing manuscripts for publication in academic media. Special consideration will be given to the digital humanities and new technology's relation to the traditional publishing trade.

HIST 653. American Material Culture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Material culture is a term encompassing all things created or modified by people -- such as clothing, tools, furniture, works of art, buildings and even landscapes. This course introduces students to the field of material culture studies and challenges them to study the American past through examination of its artifacts and architecture. Students will explore a range of disciplinary approaches and time periods, as well as the role of politics in the preservation and exhibition of material culture.

HIST 654. Oral History: Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to the practice and theories of oral history, a method employing interviews or sound recordings of people with personal knowledge of past events. Students will consider the benefits and limitations of the method as well as learn the general legal issues involved. Students will conduct their own interviews and practice the transcription of oral testimony.

HIST 691. Special Topics in History. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 9 credits. An intensive study of a selected topic in history.

HIST 692. Independent Study. 1-3 Hours.
Semester course; 1-3 credits. Maximum of 6 credits. Prerequisite: permission of department chair. Requires an analysis of a historical problem or topic in depth under faculty supervision.

HIST 693. Internship in History. 2-4 Hours.
Semester course; variable hours. 2-4 credits per semester. Maximum of 6 credits. Determination of the amount of credit and permission of departmental internship coordinator must be procured prior to registration for this course. Students receive credit for work on historical projects with approved agencies.

HIST 698. M.A. Thesis. 1-6 Hours.
1-6 credits. May be repeated for a maximum of 6 credits.

Humanities and Sciences (HUMS)

HUMS 591. Special Topics. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be repeated with different content. Specialized topics in the liberal arts and sciences designed to provide an overview of a topic not provided by an existing course or program. May be multidisciplinary.

International Studies (INTL)

INTL 500. Globalization and Transformation: Concepts and Realities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines how globalization significantly affects cultural processes at both local and national levels. Transformations of cultural understandings and practices under such circumstances will be explored. Virtual course components will bring causes, processes and consequences of the transformations of Western, Eastern and developing countries into focus. Crosslisted as: SOCY 515.

INTL 591. Topics in International Studies. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 12 credits. Open to undergraduate (junior or senior level) and graduate students. A detailed study of selected topics in one or more geographic areas or comparative studies of global phenomena. See the Schedule of Classes for specific topics to be offered each semester.

Linguistics (LING)

LING 552. Teaching English as a Second Language. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students who plan to teach English to people whose native language is not English with a variety of instructional/learning strategies. Presents and explores current approaches and methodology, as these relate to linguistic features and pedagogy. Crosslisted as: ENGL 552/TEDU 552.

LING 650. Second Language Acquisition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed for those who plan to work with English language learners in diverse instructional settings. A major focus of this course is analyzing second language acquisition theories and how they apply in classroom settings. In-depth analysis of readings will enhance the students' understanding of second language acquisition and the research related to this field. Students will observe classroom teaching, analyzing the application of SLA theories utilized in the instructional setting. Crosslisted as: TEDU 650.

Mass Communications (MASC)

MASC 591. Topics in Mass Communications. 1-3 Hours.
Semester course; variable lecture or laboratory hours (depending on topic). 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisite: permission of instructor and director of graduate studies. An advanced study of a selected topic in mass communications. See the Schedule of Classes for specific topic(s) to be offered.

MASC 602. Advertising Technology for Copywriters, Strategists and Media Planners. 2 Hours.
Semester course; 2 laboratory hours. 2 credits. Restricted to Brandcenter students only. This course covers a number of computer applications, tailored to the specific needs of copywriters, account managers, account planners and media planners. Students will learn how to create and format documents using Microsoft Word for the Macintosh, including placement of images and manipulation of text from various sources such as the Internet. Students will learn how to create computer presentations with Microsoft PowerPoint for Macintosh. This course will teach the basics of page layout, including formatting documents, placement of images and basic typography. Additionally, students will learn how to use a scanner to capture images into Adobe Photoshop, and basic image modification techniques, such as brightening and sharpening, silhouetting an image and saving the image. Additionally this course covers the appropriate applications designed to capture and edit digital video, and will include discussion of the use of the Brandcenter's digital video cameras, and other accessories such as external microphones and lights. Certain applications specific to the needs of media planners and account planners, such as Simmons, SRDS and MRI also will be covered in this course.

MASC 604. Media Stories. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will identify, create and translate stories to the multiple screens of contemporary media with an emphasis on advertising, public relations and journalism. Students study contemporary storytelling cases and create original stories for professional communications.

MASC 605. Technology in the Classroom. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. Beginning with a brief treatment of basic desktop publishing skills, students will learn layout and design using newspaper, magazine and yearbook models. They will master the functions of Photoshop, Illustrator, Adobe PageMaker and/or QuarkXpress and create promotional fliers/brochures and advertisements for their journalism programs. They will set templates and a style palette for school publications.

MASC 611. Research Methods in Mass Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Fundamentals of mass communications research techniques (content analysis, survey research, experimental design, historiography), including an overview of computer applications, statistics, theory development and trends in the published literature.

MASC 612. Mass Communications Theory. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Nature, function and application of mass communications theory; structure, content and effects of media systems; social and technological events accounted for by a generalized theory of mass communications.

MASC 613. Mass Media and Society. 3 Hours.
Semester course; 3 seminar hours. 3 credits. A study of the mass media of the United States, with special attention to their historical development and their impact on other institutions. Consideration of ethical and legal aspects of the media, and problems such as access, control and accountability.

MASC 614. Media-governmental Relations. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Study of the interaction between the media and the government, and the role of the press in the governmental process as a disseminator, opinion-maker and adversary.

MASC 615. Depth Reporting. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Prerequisites: three undergraduate reporting courses or permission of instructor. A thorough examination of one or more issues in the forefront of the news, the environment, education, health care, science and others relevant to today's readers.

MASC 616. Mass Communication Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An intensive examination of media rights and restrictions, including libel, privacy, access to information, copyright, free-press fair-trial. Attention will be given to First Amendment theory, research techniques and administrative regulation of broadcasting and advertising.

MASC 617. Advanced Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MASC 611. An examination of a mass medium through design and execution of a research project using one of the traditional research techniques of the field. Students will have major and minor projects for systematic study of a medium.

MASC 618. Media Economics and Management. 3 Hours.
Semester course; 3 colloquium hours. 3 credits. Prerequisites: MASC 611 and MASC 617. Advanced work in media management research based on an examination of major contemporary issues and challenges concerning media management and economics. Student interaction with faculty, media managers and each other will lead to the design and implementation of major problem-solving projects.

MASC 619. Media and Public Opinion. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the role of the mass media in the formation and change of beliefs and attitudes, the involvement of the media with policy makers in shaping public opinion and public policy, and the interaction of media and public opinion polling.

MASC 620. Seminar in Mass Communications History. 3 Hours.
Semester course; 3 credits. An examination of historical methodology and content as related to the investigation and writing of mass communication history in the United States. Special attention is placed on the adaptation and the use of historical method by mass communications historians.

MASC 621. Advanced Public Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will explore a variety of case studies, decision-making analyses and advanced public relations programming in relation to private and public policy-making at the senior levels of management.

MASC 626. Critical Thinking in Media. 2 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Focuses on the application of critical and creative thinking to solve communication problems. Provides students with opportunities to explore and expand their creative abilities through brainstorming sessions, creative techniques and team-oriented activities dealing with contemporary advertising, public relations and media cases.

MASC 642. Online Journalism I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Exploration and production of various means of journalistic communication using online resources. Various multimedia projects will be reviewed and discussed, as well as the best use and application of media types based on the information being communicated. Students will research news stories and examine the effectiveness of online presentations while exploring how online journalism can work with more traditional forms of communication.

MASC 643. Online Journalism II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MASC 642. Development of online journalism production skills and familiarity with the best uses and practices for publishing material on the Web and for administering news websites. Students will learn the skills for posting media and also about the systems for maintaining news organizations' entire websites.

MASC 644. Computer-assisted Reporting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 611 and 642. Provides a practical guide to online research, data analysis and other computer-assisted reporting and research skills. Students will learn how to find authoritative information, including news sources and data, through the Internet and other online resources. Students will also learn how to use spreadsheets, database managers, mapping programs, social networking analysis, statistical packages and other software to sort, summarize, analyze, visualize and present data. Course will cover how to evaluate the reliability of electronic information, how to find trends and integrate them into news reports, and how the First Amendment and journalism ethics apply to digital information.

MASC 645. Visual Journalism. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 611 and 642. A theoretical and hands-on course that immerses students in all aspects of visual journalism, including videography, photography, informational graphics and photojournalism. Examines visual communication theory and applied uses of multimedia, particularly in online journalism. Activities include professional-quality projects for multimedia publication. Addresses legal issues in producing multimedia packages, including copyright law.

MASC 646. Convergence Law and Ethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 611, 642 and 685. Explores the delicate balance that exists between freedom and control of the mass media (print, broadcast and new media). Focuses on judicial decisions and reasoning, given the impact the courts have on interpreting the First Amendment. Will also focus on new legal and ethical concerns created by the Internet and digital newsgathering and presentation technologies. Students will be immersed in the ethical decision-making process through the case-study approach.

MASC 654. Organizational Communication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of theoretical constructs of the communication process in organizations. Application of communication principles to managerial functions, training, telecommunications and other organizational situations.

MASC 658. Account Leadership. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to Brandcenter students only. Students will learn first-hand general leadership skills crucial to developing successful relationships with agency personnel and clients. Emphasis will be given to exploring ways students can contribute to accounts not only strategically but creatively as well. Students will learn presentation and communication skills as well as effective ways to manage accounts. Students will sharpen previously prepared strategies as well as interviewing skills.

MASC 660. Advertising Account Research and Planning. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisites: MASC 650 and MASC 651. Develops student's ability to choose the most effective research methods for determining both the correct target market for a product and specific issues most pertinent to that market, in regards to positioning the product. Research work with consumer groups will demonstrate student's ability to develop thoughtful questions that will deliver valuable insight.

MASC 665. Building Global Brands. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 650 and MASC 651. Restricted to Brandcenter students only. Provides thorough coverage of an approach and framework for designing a comprehensive marketing plan suitable for implementations in an international setting, with particular focus on identifying and analyzing the important cultural and environmental uniqueness of single nations or global regions. We also will look at specific examples of cases that will better inform our planning efforts and will spend time examining various cultures in order to respectfully and appropriately engage them in our marketing plan.

MASC 671. Strategic PR in a Digital Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. An introduction to the thinking and actions required to communicate strategically in today's dynamic socioeconomic environment. Focus is on the skills and information to handle strategic public relations. Introduces cutting-edge technology and using the Internet as a strategic communications tool. Professional responsibilities emphasized.

MASC 672. Strategic PR Research and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Introduces the basic theories and practices of strategic public relations research and evaluation. Both qualitative and quantitative techniques are examined.

MASC 675. Strategic PR Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. An interactive exploration of navigating challenges from the perspective of organizational culture. Helps students foster diversity, support organizational change, make leadership more dynamic, operate ethically within the cultural environment and make the organization more effective overall.

MASC 676. Public Relations Ethics and Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MASC 675 or permission of instructor. An exploration of ethical and legal dimensions specific to public relations practice. Analysis of critical cases in the field.

MASC 681. Video Applications in Instruction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 556 and 610 or permission of instructor. Emphasizes the design and instructional strategies used with the production of video resources. Differentiates analog and digital video, importing images, video and sound, editing, previewing, transitions, filters, motion settings, superimposing, titles, special effect options, and exporting video. Students will produce and edit a personalized instructional module using digital video hardware and editing software. Crosslisted as: TEDU 620.

MASC 682. Strategic Media Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 675 or permission of instructor. Focuses on what makes news, how different media work, how to determine the appropriate vehicle for the message and how to work with the media to control a message.

MASC 683. Strategic PR in the Global Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 671, 672 and permission of instructor. Examines the phenomenon of global strategic communications, including the enabling environmental factors. How to develop an integrated, holistic global communications program and how to manage such a program. Students experience one region of the world with an in-depth study tour.

MASC 684. Multiplatform Storytelling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 643, 645 and 646. Students will develop new ways of storytelling that leverage the power of the print, broadcast and online media, combining two or more of those platforms into a single, multimedia package. Analyzes the origins of multimedia and its current trends. Themes include the history of multimedia journalism, the adaptation process for traditional media, the search for a business model and the new news audience.

MASC 685. The Business of Media. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Will provide students with both a macro and micro understanding of the business operations of small and large newspapers, television and radio stations and online media. Students will examine newsroom operations, advertising and human resource issues. Will also examine laws and regulations governing media as well as ownership trends.

MASC 686. International Journalism. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 611, 642, 643, 644, 645 and 646. Explores how major news organizations in the U.S. and abroad cover international news in the 21st century as well as the various media structures and systems that are in place in countries around the world. Students will examine the power and impact of global news media in shaping public opinion. They will study trends in international coverage. Students will explore the role of the press in a democracy as well as in authoritarian or communist nations. They will examine the ethical and legal dimensions of international reporting across various media systems, regulations and protocols. The course will also emphasize the ways in which technology is rapidly changing how news is developed and disseminated. Coverage of wars and major world conflicts will also be emphasized.

MASC 688. Converged Media Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 644 and 684. Graduate-level research and production focused on multimedia. Students will complete a significant multimedia project that draws on their experiences and the skills learned in other graduate courses.

MASC 691. Topics in Mass Communications. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for 6 total credits. Prerequisite: permission of instructor and director of graduate studies. An advanced study of selected topic in mass communications. See the Schedule of Classes for specific topic(s) to be offered each semester.

MASC 692. Independent Study. 1-3 Hours.
Semester course; 1-3 credits. A maximum of 3 credits may be submitted toward the master's degree. Prerequisite: permission of instructor and director of graduate studies.

MASC 693. Practicum in Mass Communications. 1-6 Hours.
Semester course; variable hours. 1-6 credits. May be repeated for credit. Prerequisite: permission of director of graduate studies. Student participation in planned research or internship experience under the supervision of mass communications faculty. Graded as pass/fail.

MASC 694. Strategic PR Campaign Design and Implementation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MASC 675, 676, 681 and 682. Brings together all the various tasks and concepts used in public relations work to shape an effective campaign. Through projects students become competent and proficient in analyzing cases, strategizing, implementing and evaluating public relations campaigns at senior management levels.

MASC 695. Fieldwork/Internship. 1-3 Hours.
Semester course; variable hours. 1, 2 or 3 credits per semester. Maximum total of 3 credits toward graduation. Prerequisite: permission of director of graduate studies. Selected students will receive on-the-job training under the supervision of an instructor and the employer. Internships are available in newspapers, magazines, public relations, advertising, radio and television. Graded S/U/F.

MASC 697. Portfolio Development for Strategists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MASC 653. Continues the development and demonstration of critical thinking skills, insights and creative abilities in a variety of areas sought by agency planning directors, media planning directors, management supervisors and recruiters. Development of concepts and materials necessary for the creation of mini-books and individual portfolios will be one of the main focal points. Independent projects pursued specifically for portfolio development also will be conducted.

MASC 699. Thesis. 1-3 Hours.
1-3 credits. May be repeated. A maximum of 3 credits may be submitted toward the master's degree.

Mathematics (MATH)

MATH 502. Abstract Algebra I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 401 with a minimum grade of a C, or permission of instructor. A study of groups, subgroups, quotient groups and homomorphisms, group actions, sylow theorems, direct and semi-direct products, rings, integrals domains, and polynomial rings.

MATH 505. Modern Geometry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 300, and MATH 307 or MATH 310, or permission of instructor. Topics in Euclidean, projective and non-Euclidean geometries from a modern viewpoint.

MATH 507. Bridge to Modern Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to student with graduate standing. Metric spaces, normed vector spaces, inner-product spaces and orthogonality, sequences and series of functions, convergence, compactness, completeness, continuity, contraction mapping theorem, and inverse and implicit function theorems.

MATH 511. Applied Linear Algebra. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 310 or permission of instructor. The algebra of matrices, the theory of finite dimensional vector spaces and the basic results concerning eigenvectors and eigenvalues, with particular attention to applications.

MATH 515. Numerical Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to student with graduate standing. Knowledge of a programming language or mathematical software package recommended. Theoretical derivation and implementation of numerical methods. Topics to include direct methods, data fitting, differentiation, integration and solutions to ordinary differential equations.

MATH 535. Introduction to Dynamical Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing. Theoretical and computational introduction to continuous and discrete dynamical systems with applications. Topics include existence and uniqueness of solutions, stability and bifurcations.

MATH 550. Combinatorics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 211 or MATH 300; and MATH 350, both with a minimum grade of C; or permission of instructor. Topics include basic counting, binomial theorems, combinations and permutations, recurrence relations, generating functions, and basic graph theory with emphasis to applications.

MATH 555. Dynamics and Multivariable Control I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 301 and 310 or the equivalent. Systems of differential equations with controls, linear control systems, controllability, observability, introduction to feedback control and stabilization. Crosslisted as: EGRE 555.

MATH 556. Graph Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 211 or MATH 300; MATH 310; and MATH 356, each with a minimum grade of C; or permission of instructor. Introduction to graph classes, graph invariants, graph algorithms, graph theoretic proof techniques and applications.

MATH 585. Biomathematics Seminar:____. 1 Hour.
Semester course; 2 lecture hours. 1 credit. Prerequisite: MATH 301 or permission of instructor. May be repeated with different thematic content. Opportunity for students to develop their understanding of the connection between mathematics and the areas of biology and medicine. Activities include reading of classical and contemporary research literature, attending seminar talks and class discussions.

MATH 591. Topics in Mathematics. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for credit with different topics. Prerequisite: permission of the instructor. Open to qualified undergraduates. A study of selected topics in mathematical sciences. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

MATH 593. Internship in Mathematical Sciences. 3,6 Hours.
Semester course; variable hours. 1-6 credits. May be repeated for credit. Student participation in a planned educational experience under the supervision of a mathematical sciences faculty member. The internship may include supervised teaching, statistical consulting or participation in theoretical or applied research projects. A grade of P may be assigned students in this course. May be applied toward the degree in mathematical sciences only with the permission of the graduate affairs committee.

MATH 602. Abstract Algebra II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 502. A study of modules, vector spaces, field extensions and Galois theory.

MATH 607. Measure and Integration Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Math 507. Measurable sets and functions, sets of measure zero, Borel sets, Lebesgue measure and integral, fundamental convergence theorems, Lp spaces, and foundations of probability theory.

MATH 610. Advanced Linear Algebra. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Vector spaces, bases and dimension, change of basis. Linear transformations, linear functionals. Simultaneous triangularization and diagonalization. Rational and Jordan canonical forms.

MATH 615. Iterative Numerical Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 515. Theoretical development of solutions to large linear and nonlinear systems by iterative methods with consideration given to optimal implementation.

MATH 632. Ordinary Differential Equations I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MATH 507 and MATH 535. Linear systems theory; existence, uniqueness and continuous dependence for nonlinear systems; invariant manifolds; stable manifold theorem; Hartman-Grobman theorem; Lyapunov stability theory; Hamiltonian and gradient systems.

MATH 633. Partial Differential Equations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 507. Classification of partial differential equations, initial and boundary value problems, well-posedness; first-order equations and methods of characteristics; wave equation; heat equation, transform methods, maximum principle, energy methods; Laplace's equation. Other topics may vary depending on the interest of the students and the instructor.

MATH 640. Mathematical Biology I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 535. Mathematical modeling in the biological and medical sciences. Topics will include continuous and discrete dynamical systems describing interacting and structured populations, resource management, biological control, reaction kinetics, biological oscillators and switches, and the dynamics of infectious diseases.

MATH 650. Advanced Combinatorics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 550. Topics include advanced applications of the pigeonhole principle and inclusion-exclusion principle, recurrence relations, generating functions, special counting sequences, Ramsey theory, and combinatorial designs and codes.

MATH 656. Advanced Graph Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 556. This course lays a rigorous theoretical foundation for further advanced study in graph theory. Topics may include connectivity, matching, planarity, coloring, Hamiltonian cycles and topological graph theory, as well as further advanced material.

MATH 661. Number and Operations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Ways of representing numbers, relationships between numbers, number systems, the meanings of operations and how they relate to one another, and computation within the number system as a foundation for algebra; episodes in history and development of the number system; and examination of the developmental sequence and learning trajectory as children learn number concepts. A core course for preparation as a K-8 mathematics specialist. Not applicable to M.S. in Mathematical Sciences.

MATH 662. Geometry and Measurement. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explorations of the foundations of informal measurement and geometry in one, two and three dimensions. The van Hiele model for geometric learning is used as a framework for how children build their understanding of length, area, volume, angles and geometric relationships. Visualization, spatial reasoning and geometric modeling are stressed. As appropriate, transformational geometry, congruence, similarity and geometric constructions will be discussed. A core course of preparation as a K-8 mathematics specialist. Not applicable to M.S. in Mathematical Sciences.

MATH 663. Functions and Algebra. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of representation and analysis of mathematical situations and structures using generalization and algebraic symbols and reasoning. Attention will be given to the transition from arithmetic to algebra, working with quantitative change, and the description of and prediction of change. A core course for preparation as a K-8 mathematics specialist. Not applicable to M.S. in Mathematical Sciences.

MATH 664. Statistics and Probability. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to probability, descriptive statistics and data analysis; exploration of randomness, data representation and modeling. Descriptive statistics will include measures of central tendency, dispersion, distributions and regression. Analysis of experiments requiring hypothesizing, experimental design and data gathering. A core course for preparation as a K-8 mathematics specialist. Not applicable to M.S. in Mathematical Sciences.

MATH 665. Rational Numbers and Proportional Reasoning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Basic number strands in fractions and rational numbers, decimals and percents; ratios and proportions in the school curriculum. Interpretations, computations and estimation with a corrdinated program of activities that develop both rational number concepts and skills and proportional reasoning. A core course for preparation as a K-8 mathematics specialist. Not applicable to M.S. in Mathematical Sciences.

MATH 667. Functions and Algebra II. 3 Hours.
Semester course; 3 lecture hours, 3 credits. Prerequisite: Math 663 or equivalent. Examination of the K-8 strands related to algebra. A study of linear, exponential and quadratic functions. Use of number lines, coordinate axes, tables, graphing calculators and manipulatives to understand core algebraic ideas and real-world contexts. Course provides preparation for K-8 mathematics specialists. Not applicable to M.S. in Mathematical Sciences.

MATH 690. Research Seminar. 2 Hours.
Semester course; 2 lecture hours; 2 credits. Enrollment is restricted to students with graduate standing. Discussion of topics in the mathematical sciences stimulated by independent reading in selected area. Each student will give at least one oral presentation and complete an expository writing assignment.

MATH 691. Special Topics in Mathematics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Prerequisite: permission of instructor. A detailed study of selected topics in mathematics. Possible topics include commutative rings and algebras, topological groups, special functions, Fourier analysis, abstract harmonic analysis, operator theory, functional analysis, differential geometry, Banach algebras and control theory.

MATH 697. Directed Research. 1-3 Hours.
Semester course; variable hours. 1-3 credits per semester. May be repeated for credit. Prerequisite: graduate standing. Supervised individual research and study in an area not covered in the present curriculum or in one which significantly extends present coverage. Research culminates with an oral presentation and submission of a written version of this presentation to the supervising faculty member.

MATH 698. Thesis. 1-3 Hours.
Hours to be arranged. 1-3 credits. A total of 3 or 6 credits may be applied to the M.S. in Mathematical Sciences/Applied Mathematics or to the M.S. in Mathematical Sciences/Mathematics. May be repeated for credit. Prerequisite: graduate standing. Independent research culminating in the writing of the required thesis as described in this bulletin. Grade of S/U/F may be assigned in this course.

MATH 707. Functional Analysis I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 507. Banach and Hilbert spaces, bounded linear maps, Hahn-Banach theorem, open mapping theorem, dual spaces, weak topologies, Banach-Alaoglu theorem, reflexive spaces, compact operators, spectral theory in Hilbert spaces.

MATH 715. Numerical Solutions for Differential Equations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 515 or MATH 615. Students will use the finite difference method and the finite element method to solve ordinary and partial differential equations. Course will explore the theoretical underpinnings of the techniques and implement the methods to solve a variety of equations.

MATH 727. Topics in Analysis: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit with different topics. A detailed study of selected topics, which may include complex analysis, geometric analysis, harmonic analysis, mathematical logic, nonlinear functional analysis, nonstandard analysis and variational analysis.

MATH 732. Ordinary Differential Equations II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 632. Center manifold theory; normal form theory; oscillations in nonlinear systems; local bifurcation theory of equilibria and periodic orbits.

MATH 750. Topics in Combinatorics: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated with different topics for credit. Prerequisite: MATH 650. A detailed study of selected topics, which may include probabilistic methods, linear algebra methods, extremal problems, partially ordered sets and symmetric functions.

MATH 756. Topics in Graph Theory: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated with different topics for credit. Prerequisite: MATH 656. A detailed study of selected topics, which may include extremal graph theory, spectral graph theory, infinite graphs, random graphs and graph minors.

MATH 769. Topics in Applied Mathematics: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated with different topics for credit. A detailed study of selected topics, which may include advanced partial differential equations, discrete dynamical systems, fluid dynamics, computational physiology, disease dynamics, kinetic theory, optimal transportation, numerical optimization and population dynamics.

Media, Art, and Text (MATX)

MATX 601. Texts and Textuality. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores theories of texts and textuality as they relate to the study of media, the arts and discourse of any kind.

MATX 602. History of Media, Art, and Text. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the history of communication technologies in their social and cultural contexts, with an emphasis on the development of contemporary digital technology and new media. Students will explore how the interactions between communication practices and technologies are related to institutions, identity formation, cultural values, social practices and economic conditions.

MATX 603. Mass Media. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the history of mass media and the leading theories, concepts and methods for mass media research.

MATX 604. Interdisciplinary Workshop. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to first-year MATX students. Students gain an understanding of current interdisciplinary theory and practice across media, art, and text. Examination of real-world examples provides a foundation for academic and professional careers in today's interdisciplinary digital environment. Workshopping of students' preliminary dissertation ideas, conference abstracts, teaching portfolios and professional websites develops content and skills needed for the MATX e-portfolio. Graded as pass/fail.

MATX 690. Seminar in Media, Art, and Text. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Graduate-level research and reading centered on interdisciplinary study.

MATX 696. Internship. 1-3 Hours.
Semester course; variable hours. 1-3 credits; may be repeated for a maximum of 6 credits. Planned experiences approved by student's adviser under the supervision of professionals and evaluated by university faculty.

MATX 791. Directed Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits; may be repeated for credit. Focuses on a selected topic chosen by student and approved by student's adviser.

MATX 897. Dissertation Project. 1-12 Hours.
Semester course; variable hours. 1-12 credits; may be repeated for credit. Research and work leading to the completion of the dissertation project.

Nanoscience and Nanotechnology (NANO)

NANO 570. Nanoscale Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course builds a fundamental understanding of the unique properties of materials with nanoscale dimensions and emphasizes the physics and thermodynamics underlying several phenomena encountered in nanotechnology. The course starts from a general description of size effects and then moves to describe the fundamental aspects of nanocluster physics such as magic numbers, and concludes with a description of the theory and fabrication of nanoscale devices. Suggested background: PHYS 380.

NANO 571. Nanoscale Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course builds a fundamental understanding of the unique chemical properties of materials with nanoscale dimensions and emphasizes the synthetic chemistry encountered in nanotechnology. The course starts from a description of crystallization and growth models and concludes with discussion of several different synthetic approaches of nanoscale systems. Suggested background: PHYS 380.

NANO 650. Experimental Techniques in Nanoscience I. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. The course will focus on a variety of instrumental methods and techniques commonly applied to the characterization of nanomaterials. Particular attention will be placed on the theory behind the measurements, instrument safety, sample preparation and data analysis/interpretation. Topics will focus on X-ray, optical and electron characterization techniques. Suggested background: CHEM 409 or PHYS 450.

NANO 651. Experimental Techniques in Nanoscience II. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. The course will focus on a variety of instrumental methods and techniques commonly applied to the characterization of nanomaterials. Particular attention will be placed on the theory behind the measurements, instrument safety, sample preparation and data analysis/interpretation. Topics will cover morphological and physical properties characterization tools. Suggested background: CHEM 409 or PHYS 450.

NANO 660. Theoretical Studies of Nanostructures. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CHEM 660 or PHYS 580. Introduction to theoretical techniques needed to study electronic and magnetic properties of nanostructures. Covers theoretical first-principles approaches to study electronic structure of molecules, clusters, nanostructure materials and condensed matter, including determination of geometry and electronic states. Will also cover magnetic properties in reduced sizes, including quantum effects and the model Hamiltonians. A brief discussion of effective interatomic molecular potentials and their application in monte-carlo and molecular dynamics methods will be included, as well as a discussion of application of nanomaterials to medical areas. Suggested background: CHEM 660 or PHYS 580.

NANO 661. Computational Nanoscience. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CHEM 511, CHEM 512 or CHEM 612. Open only to students admitted to the Nanoscience and Nanotechnology Ph.D. program. Introduction to computational methods used to model true nanostructures containing more than 10⁵ atoms and whose assembly, morphology and properties are governed by noncovalent interactions. Structural and dynamic aspects of the computational methods will be covered throughout the course. Applications to nanotechnology and environmental cleanup will be covered through special topics assignments during the semester and discussed by the end of the course.

NANO 690. Research Seminar in Nanoscience and Nanotechnology. 1 Hour.
Semester course; 2 lecture hours. 1 credit. May be repeated for credit. In addition to reports presented by staff and visiting lecturers, current problems and developments in nanoscience and nanotechnology are discussed. Graded S/U/F.

NANO 692. Nanoscience Seminar Presentation. 1 Hour.
Semester course; 2 lecture hours. 1 credit. May be repeated for credit. In addition to reports presented by students, staff and visiting lecturers, current problems and developments in chemistry are discussed.

Operations Research (OPER)

OPER 527. Optimization I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Introduction to optimization and mathematical programming. Course addresses fundamental concepts of optimization (such as optimality conditions and duality) as well as the construction, solution, analysis and application of linear programming and network models. Emphasis is placed on using software to solve problems as well as on understanding its underlying methodology. Integer programming models will be introduced. Students may not receive degree credit for both OPER 427 and OPER 527.

OPER 528. Stochastic Simulation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status in mathematical sciences, systems modeling and analysis, or decision sciences and business analytics, or permission of the instructor. An introduction to stochastic discrete-event simulation. The course covers simulation modeling and programming in general-purpose languages (e.g., VBA for Excel) and (briefly) in specialized simulation environments (e.g., Arena, @Risk). The probability foundations of stochastic simulation of stochastic processes, random number and variate generation, variance reduction techniques, and proper design and analysis of the simulation experiment are emphasized. Applications are drawn from manufacturing, finance, logistics and service systems. Students may not receive degree credit for both OPER 428 and OPER 528.

OPER 591. Topics in Operations Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be taken more than once for credit. Prerequisite: permission of the instructor. A detailed study of selected topics in operations research.

OPER 627. Optimization II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OPER 527. This course will address basic theory and algorithms for nonlinear optimization (unconstrained and constrained). Both theoretical foundations and practical implementations of optimization algorithms will be covered.

OPER 635. Network Models and Graph Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OPER 527 or permission of the instructor. This course will focus on optimization models for network problems, as well as on the underlying graph theoretic structure for such models. Emphasis will be on solution procedures and applications with some discussion of related implementation issues. The course will concentrate on the study of polynomial-time algorithms for well-solved problems. May also include treatment of solution techniques for NP-hard network problems. Possible topics for the course include, but are not limited to, maximum flows/minimum cuts in networks, minimum spanning trees, minimum cost flows, matching and assignment, shortest path problems, traveling salesman problems and multicommodity flows.

OPER 636. Machine Learning Algorithms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate status in mathematical sciences, systems modeling and analysis, decision sciences and business analytics, or computer science, or by permission of the instructor. Includes an in-depth analysis of machine learning algorithms for data mining, equipping students with skills necessary for the design of new algorithms. Analyses will include framing algorithms as optimization problems and a probabilistic analysis of algorithms. Students will be exposed to current areas of research in the construction of data mining algorithms. Crosslisted as: STAT 636.

OPER 639. Practical Optimization. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OPER 527. The application of optimization theory toward the solution of practical problems in operations research. The use and analysis of computer programs available to solve such problems. The algorithms used in these programs will be discussed from a practical and theoretical point of view.

OPER 641. Stochastic Simulation and Monte Carlo Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 513 and either STAT 503 or STAT 613. Addresses the methodological foundation of applying stochastic modeling and simulation with a focus on introducing simulation concepts through examples, algorithms and experiments. Topics include simulation output analysis, input modeling, simulation optimization, steady-state simulation, variance reduction techniques, sensitivity analysis and Monte Carlo optimization.

OPER 643. Decision and Risk Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status in mathematical sciences, systems modeling and analysis, or decision sciences and business analytics, or permission of the instructor. This course presents the decision and risk analysis theory and methodology. Decision analysis applies to hard problems involving sequential decisions, major uncertainties, significant outcomes and complex values. The course includes: decision structuring with influence diagrams and decision trees; modeling uncertainty with subjective probabilities; sensitivity analysis and the value of information; and modeling preferences with utility functions. Decision and risk analysis applications in business and government are considered.

OPER 645. Queuing Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. This operations research course provides a development of some basic queuing systems. Such systems will include birth-death queues, as well as the M/G/I and GI/M/S queuing systems. Other topics may include the GI/G/I queues, overflow queues and some basic queuing networks.

OPER 647. Multiobjective Decision Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences, systems modeling and analysis, or decision sciences and business analytics, or permission of the instructor. Introduction to the mathematical foundations of multiattribute utility theory. Topics covered include: structuring objectives; tradeoffs under certainty; unidimensional utility theory; multiattribute preferences under uncertainty; preferences over time; and aggregation of individual preferences. Real world applications will be discussed throughout.

OPER 648. Systems Reliability Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. An introduction to engineering reliability and risk analysis, specifically failure data analysis, maintenance problems, system reliability and probabilistic risk assessment. Applications in computer science and engineering will include stochastic characterization of wear in hardware systems and the development of failure models for software systems. Decision problems such as the optimal maintenance of repairable systems and optimal testing policies for hardware and software systems will be examined. The analysis of risk through fault trees, event trees and accident precursor analysis also will be discussed. Crosslisted as: STAT 648.

OPER 649. Statistical Quality Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Demonstrates how statistics and data analysis can be applied effectively to process control and management. Topics include the definition of quality, its measurement through statistical techniques, variable and attribute control charts, CUSUM charts, multivariate control charts, process capability analysis, design of experiments, and classical and Bayesian acceptance sampling. Statistical software will be used to apply the techniques to real-life case studies from manufacturing and service industries. Crosslisted as: STAT 649.

OPER 691. Special Topics in Operations Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be taken more than once for credit. Prerequisite: permission of the instructor. A detailed study of selected topics in operations research.

OPER 696. Applied Project. 1-3 Hours.
Semester course; 1-3 lecture hours (to be arranged). 1-3 credits. Up to three credits will be applied to the M.S. in Mathematical Sciences (operations research or statistics concentration) per section. Can be repeated for credit. Prerequisite: SSOR 690 or permission of the faculty adviser. Designed to allow students to apply concepts and theories learned in other courses to a practical situation. Includes the selection, written description, completion and written report of the project and a presentation of the findings. Students may not receive credit for both OPER/STAT 696 and OPER/STAT 698. Graded as Satisfactory/Unsatisfactory. Crosslisted as: STAT 696.

OPER 697. Directed Research. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be taken more than once for credit. Prerequisite: graduate standing. Supervised individual research and study in an area not covered in the present curriculum or in one which significantly extends present coverage. Research culminates with an oral presentation and submission of a written version of this presentation to the supervising faculty member.

OPER 698. Thesis. 1-3 Hours.
Hours to be arranged. 1-3 credits. A total of 3 or 6 credits may be applied to the M.S. in Mathematical Sciences/Operations Research. (A total of 3 credits for an expository thesis or a total of 6 credits for a research thesis.) May be taken more than once for credit. Prerequisite: graduate standing. Independent research culminating in the writing of the required thesis as described in this bulletin. Grade of S/U/F may be assigned in this course.

OPER 731. Discrete Optimization. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OPER 527. Provides the theoretical background necessary to design and evaluate advanced solution techniques for discrete optimization problems. Topics include theory of polyhedra and valid inequalities for integer programming models, matchings, computational complexity, and sufficient conditions for integer programs to be polynomially solvable. Scheduling, packing, covering and routing models will also be examined.

OPER 732. Optimization Under Uncertainty. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: OPER 527; graduate standing in mathematical sciences or systems modeling and analysis; or permission of the instructor. Offers an exploration of issues concerning decision-making problems under uncertainty using mathematical programming tools. Topics addressed include modeling uncertainty in optimization models, two-stage stochastic programs with recourse, chance constrained programs, statistical inference in stochastic programs and robust optimization. Special attention is paid to the algorithms, approximation via sampling and applications.

OPER 736. Mathematics of Knowledge and Search Engines. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 541 or equivalent. Investigates the mathematics, methods and algorithms for searching for and extracting structures of interest (knowledge) from large and possibly high-dimensional datasets. The motivation is the rapid and phenomenal growth of the search engine (as demonstrated by Google) as a major tool for search on the Internet, which has impacted commerce, education and the study of social, financial and scientific datasets. The development of the mathematical and statistical learning algorithms behind these search engines has led to advances in how large, high-dimensional datasets can be effectively analyzed for the extraction of knowledge. Crosslisted as: STAT 736.

OPER 741. Advanced Stochastic Simulation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 513, OPER 528 and either OPER 503 or 613, or permission of the instructor. This is an advanced-level course on stochastic modeling and simulation. State-of-the-art topics on simulation theory and methodology will be taught through lectures and guided literature review. Tentative topics include advanced simulation output analysis, simulation optimization, steady-state simulation, nested simulation, metamodeling, variance reduction (stratification, importance sampling, quasi-Monte Carlo, etc.).

OPER 743. Decision Analysis II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: OPER 643 or OPER 647. Introduces the current areas of research in the field of decision analysis, which applies to hard problems involving sequential decisions, major uncertainties, significant outcomes and complex values. Includes current research in decision structuring and representation, modeling uncertainty with subjective probabilities, modeling preferences with utility functions and modeling multiattribute preferences.

OPER 791. Special Topics in Operations Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Prerequisite: permission of instructor. A detailed study of selected advanced topics in operations research.

Philosophy (PHIL)

PHIL 521. Aesthetics. 3 Hours.
Semester courses; 3 lecture hours. 3, 3 credits. A critical survey of aesthetics from antiquity to the 20th century. First semester: antiquity to the Renaissance; Second semester: the Renaissance to the present. Topics to be considered include the nature of art, aesthetic experience, the aesthetic analysis in the arts of painting, music, architecture and the motion picture.

PHIL 522. Aesthetics. 3 Hours.
Semester courses; 3 lecture hours. 3, 3 credits. A critical survey of aesthetics from antiquity to the 20th century. First semester: antiquity to the Renaissance; Second semester: the Renaissance to the present. Topics to be considered include the nature of art, aesthetic experience, the aesthetic analysis in the arts of painting, music, architecture and the motion picture.

PHIL 591. Topics in Philosophy. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Prerequisite: written permission of instructor or graduate standing. A graduate-level, in-department study of an individual philosopher, a particular philosophical problem or a narrowly defined period or school. See the Schedule of Classes for specific topics to be offered each semester.

PHIL 592. Independent Study. 1-4 Hours.
Semester course; 1-4 credits. An independent study course to allow graduate students to do research, under the direction of a professor qualified in that field, in an area of major interest.

PHIL 601. Principles of Ethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing. An examination of major ethical theories and their application to contemporary issues in medicine, science and public policy.

PHIL 602. Biomedical Ethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of ethical theory and its application to moral problems in medicine and biotechnology.

PHIL 635. Philosophy of the Social Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A philosophical study of the nature of science and scientific explanation, with emphasis upon the social sciences. Topics include the philosophical analysis of objectivity in the social sciences, theories of human action and the relation of social sciences to the physical sciences.

PHIL 683. Administrative Ethics. 2,3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. A philosophical investigation into the problems of making ethical decisions, focusing on issues likely to confront the public administrator. Examples of such issues are equity in social services delivery, affirmative action, loyalty to the bureaucracy vs. "whistle blowing," and conflicts of interest between personal and public interest. Crosslisted as: PADM 683/GVPA 683.

PHIL 691. Topics in Philosophy. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Prerequisite: written permission of instructor or graduate standing. A graduate-level, in-depth study of an individual philosopher, a particular philosophical problem, or a narrowly defined period or school. See the Schedule of Classes for specific topics to be offered each semester.

PHIL 692. Independent Study. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Open to graduate students only. An independent study course to allow graduate students to do research, under the direction of a professor qualified in that field, in an area of major interest.

PHIL 713. Ethics and Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Doctoral students only. An examination of the main theories of morality and justice. These theories' implications for public policy will be discussed. Crosslisted as: PPAD 713.

Physics (PHYS)

PHYS 508. The Physical Science of Space for Teachers. 3 Hours.
Semester course; 3 credits. Prerequisites: B.S. or B.A. degree with at least two mathematics and two science courses or permission of instructor. The course is designed for the secondary physical science and physics teachers. The physical science phenomena of the solar system and the universe: mechanics, electromagnetism, optics and energy are presented for the teacher. The course curriculum closely follows the Virginia Science Standards of Learning for Physics and Physical Science. The course makes use of the Virginia Science Museum's interactive physical science exhibit galleries (aerospace, force and motion, waves and patterns, light and vision matter, crystals and electromagnetism as well as the Digistar planetarium and telescopes).

PHYS 509. Experiencing Science for Teachers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: B.S. or B.A. degree with at least two mathematics and two science courses or permission of instructor. Designed to give physical science and physics teachers an understanding of the methods and processes actually used by scientists in different disciplines. Students repeat classic experiments, read from original works, keep detailed research journals, participate in laboratory experiments, engage in the peer review process and present results of projects in colloquium format. The course meets at the Science Museum of Virginia and uses the interactive science exhibits; visits to science sites in the area.

PHYS 510. Physical Science Demonstrations. 3 Hours.
Semester course; 3 credits. Prerequisite: PHYS 509 or permission of instructor. The course is designed to give the working secondary physical science and physics teacher a depth of experience in designing and effectively using experiments to interpret phenomena for students. Participants learn the essentials of developing effective apparatus for investigations, interactive exhibits and demonstrations in the physical sciences. Students will undertake and present a major project as part of the course.

PHYS 514. Modeling Biocomplexity. 3 Hours.
Semester course; 2.5 lecture and .5 laboratory hours. 3 credits. Prerequisite: one year of calculus. Introduction to the modeling and simulation of the behavior of complex biological systems, including models in both continuous and discrete time. Numerical methods using mathematica, analytical methods using calculus and laboratory experiments using computer interfaces will be used to study population dynamics and the behavior of physiological systems exhibiting such properties as oscillations and chaotic biological dynamics. Crosslisted as: BNFO 514.

PHYS 522. Optics and Laser Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHYS 376 or permission of instructor. The purpose of this course is to introduce a range of topics from optics and the principles of laser operation. Topics include waves, physical optics, geometric optics, superposition, interference, polarization, diffraction, Fourier optics, coherence, lasers, second quantization.

PHYS 550. Techniques in Material Research. 3 Hours.
Semester course; 4 laboratory and 2 lecture hours. 3 credits. Prerequisite: PHYS 450 or graduate standing. This course focuses on the application of modern characterization techniques in materials research. Techniques to be studied include high-resolution X-ray diffraction, low-energy electron diffraction, light-energy electron diffraction, scanning-tunneling microscopy, molecular beam epitaxy, Auger electron spectroscopy and X-ray photoemission spectroscopy.

PHYS 571. Theoretical Mechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 376 and PHYS 380, or graduate standing. An introduction to advanced dynamics involving the Lagrangian and Hamiltonian formalisms.

PHYS 573. Analytical Methods in Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 376 and PHYS 380, or graduate standing. Theoretical and numerical techniques in solving differential equations in condensed matter. Classification of electronic states in solids and clusters using groups, infinite series approximations, calculus of residues and causality.

PHYS 576. Electromagnetic Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHYS 571. Maxwell's equations of electromagnetism, vector and scalar potentials, electromagnetic waves and radiation theory.

PHYS 580. Quantum Mechanics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHYS 571. Theoretical quantum descriptions with emphasis upon mathematical techniques. Schrodinger equation, hydrogen atom, eigenfunctions and eigenvalues, angular momentum and spin and perturbation theory.

PHYS 583. Geometrical Methods of Physics and Gravitation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 571 and PHYS 573 or permission of instructor. Introduction to the language of differential geometry that is needed for research in gravitation and cosmology. Topics include tensors, connections on manifolds, gauge-invariant field theories and Einstein's theory of general relativity. Examples include black holes and cosmological solutions of Einstein's field equations.

PHYS 591. Topics in Physics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Open to graduate students and to undergraduate students with advanced standing. An in-depth study of a selected topic in advanced physics. See the Schedule of Classes for specific topics to be offered each semester and prerequisites. Applicable toward physics major requirements.

PHYS 640. Equilibrium Statistical Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 571 and PHYS 580. Fundamentals of equilibrium statistical physics. Topics include review of thermodynamics, canonical and grand canonical partition functions, mean-field theories, Ising and Bragg-Williams models, Landau theory, fluctuations about the mean field, critical phenomena, exact solution to the one-dimensional Ising model, two-dimensional Ising model and the renormalization group.

PHYS 641. Solid State Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHYS 571 and PHYS 580. Study of structure and electronic properties of materials in the solid phase.

PHYS 650. Subatomic Physics I. 3 Hours.
Semester course; 3 credits. Prerequisites: PHYS 576, PHYS 580 and CHEM 510. Studies of nuclei and elementary particles, reaction dynamics, particle accelerators, detection devices, particle classification, symmetries and conservation laws, quantum electrodynamics, the weak interaction, quantum chromodynamics, unified theories, the nuclear shell model and collective model, and nuclear reactions. Offered in cooperation with Virginia State University.

PHYS 651. Subatomic Physics II. 3 Hours.
Semester course; 3 credits. Prerequisite: PHYS 650. A continuation of PHYS 650. Offered in cooperation with Virginia State University.

PHYS 661. Surface and Materials Physics. 3 Hours.
Semester course; 3 credits. Prerequisites: PHYS 641, CHEM 510 or permission of instructor. This course will focus on the physics of surface, interfacial and other nanostructured material systems, and the experimental techniques used to assay their geometric and electronic properties. Topics include ultra-high vacuum techniques and design, surface geometric and electronic structure, adsorbates on surfaces and interface formation, thin film growth, and layered systems. Characterization techniques to be discussed include geometric probes (STM, AFM, RHEED, LEED, AFM, XRD) and synchrotron radiation-based electronic structure probes (PES, SXF, NEXAFS).

PHYS 663. Studies in Nuclear Physics. 3 Hours.
Semester course; 3 credits. Credits for only two televised courses will count toward degree requirements. Courses televised by the Virginia Cooperative Graduate Engineering Program. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

PHYS 670. Conceptual Physics for Teachers I. 3 Hours.
Semester course; 4 studio hours. 3 credits. Prerequisites: PHYS 508, PHYS 509 and PHYS 510, or permission of instructor. First of the sequence 670-672. Development of the methodology for the experimental design at middle and high school level, concentrating on the science of measurement, materials structure and characterization, and light and optical properties of matter. The 670-672 sequence uses and develops computer-based experiments and interactive multimedia materials for use in the classroom. The course contains examples of vertical integration of technological applications of physical principles across disciplines.

PHYS 671. Conceptual Physics for Teachers II. 3 Hours.
Semester course; 4 studio hours. 3 credits. Prerequisite: PHYS 670 or permission of instructor. Second of the sequence PHYS 670-672. Development of the methodology for experimental design at middle and high school level, concentrating on sound and acoustics, electromagnetism and classical mechanics.

PHYS 672. Conceptual Physics for Teachers III. 3 Hours.
Semester course; 4 studio hours. 3 credits. Prerequisite: PHYS 671 or permission of instructor. Third of the sequence PHYS 670-672. Development of the methodology for the experimental design at middle and high school level, concentrating on heat, thermodynamics and modern physics.

PHYS 690. Research Seminar. 1 Hour.
Semester course; 1 credit. May be repeated for a maximum of 4 credits. Examines current problems and developments in physics.

PHYS 691. Special Topics. 3 Hours.
Semester course; 3 credits. Prerequisites: at least one graduate-level physics course and permission of instructor. Selected topics in physics from such areas as statistical physics, quantum field theory, semi-conductor device physics, general relativity, electronic structure of solids, thin-film fabrication techniques, superconductivity, nuclear magnetic resonance techniques, crystallography and nuclear physics.

PHYS 697. Directed Research. 1-15 Hours.
Semester course; 1-15 credits. May be repeated for credit. Prerequisites: at least one graduate-level physics course and permission of instructor. Research leading to the M.S. or Ph.D. degree.

Political Science (POLI)

POLI 591. Topics in Political Science. 3 Hours.
Semester course; 3 credits. An in-depth study of a selected topic in political science in a seminar environment. Intended for small groups of students interested in examining issues and problems related to aspects of the political processes.

Psychology (PSYC)

PSYC 601. Foundations of Applied Developmental Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in the psychology program or permission of instructor. An introduction to developmental research and theory on applied research topics. Topics include ethical issues in applied developmental science, culture, ethnicity and child development, poverty, child abuse, nontraditional families, childcare, family instability, early childhood intervention and parenting.

PSYC 602. Psychology of Aging. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Enrollment requires permission of instructor. Students must complete social sciences research methods before taking this course.Psychological adjustment in late life; special emphasis on personality, cognitive and emotional development; life crises associated with the aging process. Crosslisted as: GRTY 602.

PSYC 603. Developmental Processes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Cognitive, social, personality and behavioral development across the life span is considered, with special attention to theories of development.

PSYC 604. Social Psychology of Business and Industry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PSYC 630 or permission of instructor. The theme is the influence of organizational structure on behavior. Topics will include motivation, attitudes, job satisfaction, morale, leadership and supervision.

PSYC 605. Social Development. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: PSYC 603 or permission of instructor. The development of social relations, focusing primarily on infancy and childhood, but also considering adulthood and aging. Attachment, parent-child interaction, peers, siblings, aggression, sex-roles, cultural determinants, deprivation and remediation, social cognition, adulthood changes, parenthood. Critical evaluation of theory and current research.

PSYC 606. Development in Middle Childhood. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Prerequisite: graduate standing in the psychology program or permission of instructor. An introduction to theory and research on children during middle childhood. Topics include language, intelligence, early education, schooling, social cognition, theory of mind, attachment, social competence, emotions and socialization.

PSYC 607. Advanced Educational Psychology for Elementary Teachers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Application of the principles of psychology to the teaching-learning process in the elementary classroom. Discussion will focus on the comprehensive development of individual learning experiences and educational programs from the point of view of the educator and administrator. Crosslisted as: EDUS 607.

PSYC 608. Research in Counseling Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: Graduate standing in the counseling psychology program or permission of counseling committee. An introduction to the theoretical, procedural, methodological and ethical issues encountered during the conduct of empirical research in counseling psychology. Topics include the empirical analysis of such mainstream counseling research activities as assessment, interventions, consultation, supervision, training, psychosocial factors in health and prevention, career development, the study of diversity and underrepresented populations, and professional issues in counseling psychology.

PSYC 609. Contemporary Issues in Clinical Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: first-year graduate standing in clinical psychology or permission of the instructor. Informs first-year doctoral students of the philosophy behind the training model and the requirements of the doctoral program in clinical psychology in the context of the current status of contemporary issues in the field. Includes coverage of traditional and innovative training models, research issues, the role of assessment and psychotherapy in clinical psychology, the medical vs. the behavioral model of psychopathology, relations with other mental health professions, professional issues such as licensure and credentialing, and malpractice.

PSYC 610. Attitude Theory and Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and research in attitudes. Attitude formation and change, including cognitive consistency, learning and reinforcement, social judgment, and functional theories.

PSYC 611. Contemporary Issues, Supervision and Leadership in Counseling Psychology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Contemporary issues, problems and research related to the practice of counseling psychology; their importance in developing a professional identity and sensitivity to major developments in the field; history, present status and future directions in the field of counseling psychology.

PSYC 612. Seminar in Motivation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A survey of some theoretical views of motivation. Biological, cultural personality and learning theories of motivation will be covered. Theoretical positions will be related to current empirical findings.

PSYC 613. Cognitive Development. 3 Hours.
Semester course; 3 lecture/discussion hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. The development of the intellectual processes, including reasoning, memory, imagery and knowledge. Special attention will be given to theories of cognitive growth. Although the focus will be on child cognitive developments, consideration of life-span issues will be included.

PSYC 614. Development in Infancy and Early Childhood. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Prerequisite: PSYC 603 or permission of instructor. An introduction to theory and research on children from birth to early childhood, including sensory and behavioral capacities; cognitive, social and emotional development; and contexts of development (especially the family). Emphasis on stage1salient tasks of development and the effects of early experience on function later in life. Consideration of the challenges associated with research and intervention with these age groups.

PSYC 615. Aging and Mental Disorders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course deals with common psychological disorders and problems of late life, their etiology, methods of evaluating psychological status and intervention strategies that have been used successfully with older persons. Topics include epidemiology of psychological disorders and mental health service utilization; late-life stressors and crises; psychology of health, illness and disability; techniques and procedures in the evaluation of the older adult; functional and organic disorders; institutionalization; individual, group and family therapy; behavioral techniques; peer counseling and crisis intervention; and drugs and the elderly. Crosslisted as: GRTY 615.

PSYC 616. Psychopathology. 1,3 Hour.
Semester course; variable hours. 1 or 3 credits. May be taken only one time for credit toward degree. Prerequisite: permission of instructor. Clinical and experimental contributions to the field of psychopathology, with particular attention to the roles of learning and motivation in the development of behavior disorders.

PSYC 617. Sensation and Perception. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The major phenomena of vision, audition, olfaction, gustation and the skin senses. Psychophysics and the effects of sensory deficits. The relationship of variations in environmental energy to the psychological reactions of sensing and perceiving.

PSYC 618. Seminar in Personality. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. A detailed exploration of various approaches in personality. Contemporary issues in personality theory.

PSYC 619. Learning and Cognition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Covers principles and theories of learning and cognitive psychology from simple associative learning through memory, comprehension, thinking and social behavior.

PSYC 620. Design and Analysis of Psychological Research. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: undergraduate course in basic statistics or permission of instructor. An introduction to research design in psychology (e.g., logic behind various research designs, typical research problems). Review of principles of hypothesis testing, general linear model, analysis of variance including factorial designs with special emphasis on prior and post-hoc comparisons, repeated-measures designs and mixed designs.

PSYC 622. Physiological Correlates of Emotion. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Research and theories of emotion emphasizing physiological bases, with special attention to neurological and endocrine systems. Applications to psychological functioning.

PSYC 623. Counseling Theories and Personality. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment requires permission of instructor. Overview of major trends in personality theory, techniques and current research in psychotherapies as they apply to counseling psychology. Includes descriptions of some brief psychoeducation and preventive interventions and stresses accountability in outcome of all interventions.

PSYC 624. Group Counseling and Psychotherapy. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: permission of instructor. Historical perspective. Basic dynamics and processes of therapeutic groups. Role and technique of the group facilitator. Examination of different theoretical approaches.

PSYC 625. Career Development and Occupational Health. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: permission of instructor. A review of major theories and current research in career development and topics in occupational health are presented. Theory, research and techniques associated with vocational assessment and intervention are reviewed. Emphasis on late adolescent and adult populations.

PSYC 626. Single-case Experimental Design for the Clinical Research Practitioner. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: permission of instructor. Review of single-case design models that have utility for clinicians in evaluating their practice. Emphasis will be placed on the historical development of the field and on the main experimental design issues that are relevant to the conduct of single-case research.

PSYC 627. Research Methods in Clinical Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: PSYC 680 and graduate standing in clinical or counseling psychology, or permission of instructor. Examines the role of research in clinical psychology and experimental design issues in psychotherapy research.

PSYC 628. Psychology of Adolescence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Theories and research on the social, personality and cognitive development of adolescents. Emphasis is placed on the development of identity and relationships with family and peers, within the contexts of home, school, work and community. Variations in development related to cultural differences will also be the focus, but atypical behavior will be explored. Normal adolescent behavior will also be addressed. Current research ideas will be examined.

PSYC 629. Biological Basis of Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: an undergraduate course in physiological psychology or permission of instructor. Theory and current experimental research on the physiological and neurological concomitants of behavioral variables.

PSYC 630. Social Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Topics include attitudes, social influence processes, person perception, affiliation and attraction, group processes, cultural influences on behavior and conformity.

PSYC 631. Evaluation Research: Psychological Perspectives. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the student with knowledge of and skills in evaluation research. Additionally, students will learn how to apply psychological theories and applied research methods in evaluating psychological interventions and treatment programs. The class covers several key aspects of evaluation: 1) use of psychological theory in evaluations, 2) defining the problem, 3) contextual issues surrounding the evaluation, 4) selecting the appropriate type and design of evaluation, 5) methodological issues and 6) steps involved in conducting an evaluation of process and outcome. Course will attend to: a) theoretical, b) political, social and contextual factors that impact an evaluation, c) cultural considerations when conducting an evaluation, d) practical and logistical considerations and e) effective collaboration with community partners. Course examples and materials will be drawn from the professor's experiences with evaluating community-based psychological interventions and prevention programs and the experiences of guest presenters.

PSYC 632. Research Methods in Social Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisites: PSYC 680 and PSYC 630. Epistemological, methodological, technical and ethical problems encountered during the scientific study of social psychological phenomena. Emphasizes practical experience in theory development, hypothesis derivation, research planning, data collection, reduction and analysis, and dissemination strategies.

PSYC 633. Group Dynamics. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: PSYC 630 or permission of instructor. Theoretical explanations and empirical research related to group formation, development, performance and dissolution. Topics include obedience, conformity, group productivity and leadership.

PSYC 634. Attribution and Social Cognition. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: PSYC 630. Analysis of the perceptual and inferential processes that influence the perceiver's understanding of others' traits and characteristics. Examines theoretical perspectives and current empirical studies of the intuitive use of behavioral data in making inferences concerning the causes of actions and events and the cognitive mechanisms that structure inferences about others' qualities.

PSYC 635. Psychology of Health and Health Care in the Elderly. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents health psychology models, theories and issues relating to the etiology, course and treatment of illness in the elderly. Covers older patient-practitioner interaction, compliance, late-life stress and illness, and psychosocial issues in terminal care.

PSYC 636. Research Methods in Developmental Psychology. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: PSYC 680. Research designs, methods, ethical issues and problems specific to developmental psychology. Cross-sectional, longitudinal and sequential strategies. Statistical issues, multivariate statistics and choice of statistical designs appropriate for developmental research questions. Computer skills in organizing and analyzing data. Grant writing and scientific reporting.

PSYC 637. Operant Behavior. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Presents an overview of the methodology, terminology and phenomena unique to the experimental analysis of behavior. Topics include operant methodology, schedules of reinforcement, stimulus control, acquisition of behavior, conditioned reinforcement, punishment, scheduled-induced behaviors and use of operant techniques in drug research.

PSYC 638. The Evolution of Psychological Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: core course in student's area of specialization or permission of instructor. A survey of the development and present state of various psychological systems. Current meta-theoretical and systematic issues in psychology.

PSYC 639. Research Methods in Biopsychology. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisite: permission of instructor. Methodological, technical and ethical problems in biopsychology. Examples are design and use of circuits in behavioral sciences, stereotaxic surgery, histology, drug procedures, research design, data collection procedures and data analysis.

PSYC 640. Parenting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is about parenting. Students review and discuss theories and literature on human parenting, including the history of parenting, contextual issues in parenting, parenting at different stages of children's lives (from pregnancy and infancy through having adult children) and parenting children with special needs (including disabilities and behavior problems). Also covers parent training and education, the journey to becoming a parent through adoption, parenting contributions to social, emotional and cognitive competence, child maltreatment and public policy around parenting. Students review parenting in different family structures including married, never married, divorced and separated families. This is not a course on how to parent, but practical issues in the lives of parents are discussed.

PSYC 641. Survey of Psychological Assessment and Treatment of the Older Adult. 3 Hours.
3 credits. A combination didactic and skills training course; review of major treatment strategies and techniques for utilization with the older adult client with emphasis on group, individual and paraprofessional delivery systems; evaluation of crisis intervention and consultation team approaches; lectures, demonstration and classroom practice of actual treatment techniques. Crosslisted as: GRTY 641.

PSYC 642. Practicum in Clinical Geropsychology. 3 Hours.
3 credits. An initial practicum geared as an entry to the team practicum experience; focus on familiarizing the student with mental health service delivery systems for the elderly in the Richmond community; rotation through a limited number of facilities such as nursing homes, retirement centers, nutrition sites, emergency hotline services for the elderly and various agencies involved in deinstitutionalization; possible extended placement in a particular facility. Crosslisted as: GRTY 642.

PSYC 643. Principles of Psychological Measurement. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: graduate standing in psychology or permission of instructor. Basic psychometric concepts to prepare the student for subsequent evaluation instruments. Origins and logic of testing, criteria for judging tests, standardization and reliability, and validity and principles of test development and construction.

PSYC 644. Individual Tests of Intelligence. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: graduate standing in clinical or counseling psychology or permission of counseling or clinical psychology program. Examines the administration, scoring, interpretation and research foundations of the major individual tests of intelligence. Emphasizes the Wechsler scales and the measurement of adult and child intelligence. Develops psychological report writing skills.

PSYC 645. Assessment of Personality. 2,3 Hours.
Semester course; variable hours. 2 or 3 credits. Prerequisite: graduate standing in clinical or counseling psychology, or permission of clinical or counseling psychology program and instructor. Examines use of objective and projective tests in assessment of personality. Emphasizes clinical interpretation of the Minnesota Multiphasic Personality Inventory (MMPI), and the administration and clinical interpretation of the Rorschach and Thematic Apperception Test (TAT). Stresses integrative report writing.

PSYC 646. Projective Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in clinical or counseling psychology or permission of counseling and clinical program committee. Projective devices for the assessment of personality. Supervised administration, scoring, interpretation and written reports of individually administered projective personality tests.

PSYC 647. Neuropsychological Assessment. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: graduate standing in psychology and permission of instructor. Psychological assessment of brain-behavior relationships in the context of neurological or neurosurgical problems. Emphasis is on current modifications of Halstead's tests and on the Reitan-Indiana Neuropsychological Battery for younger children. Laboratory requires supervised administration, scoring and interpretations of neuropsychological test batteries.

PSYC 648. Behavioral Assessment of Clinical Problems. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in psychology and permission of instructor. Development, evaluation, use and interpretation of behavioral approaches to the assessment of clinical problems, including self-monitoring, behavioral ratings and direct observational assessment procedures. Both existing instruments and procedures for designing new instruments will be discussed.

PSYC 649. Clinical Assessment of Child Disorders. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisites: PSYC 643 and graduate standing in clinical psychology, or permission of clinical program committee and instructor. Administration and interpretation of intellectual and personality assessment instruments for children. Laboratory requires supervised administration, scoring, interpretation and written reports of these assessment instruments.

PSYC 650. Advanced Child Psychopathology. 1,3 Hour.
Semester course; variable hours. 1 or 3 credits. May be taken only one time for credit toward degree. Principal childhood behavioral abnormalities: mental retardation, psychosis, learning disabilities, speech and language problems, school-related behavioral problems, neurosis, psychosomatic disorders and juvenile delinquency. Genetic, prenatal, perinatal, postnatal and social-psychological factors related to etiology. Integration of assessment and treatment methods.

PSYC 651. Theories of Counseling and Interviewing. 1-3 Hours.
Semester course; variable hours. 1, 2 or 3 credits. Prerequisites: graduate standing in counseling or clinical psychology, and permission of instructor. Introduces basic principles of interviewing as they apply to theories and practice of psychotherapy and counseling. Laboratory requires videotaping of simulated counseling/psychotherapy session, modeled and role-played interviewing situation, skill development and demonstration, and evaluative interpersonal feedback.

PSYC 652. Child and Adolescent Psychotherapy. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in psychology and permission of the instructor. Presents the major approaches to psychological interventions for children's and adolescents' behavioral and emotional disorders. Includes a review of empirical research evaluating the effectiveness of contemporary psychological interventions for specific disorders.

PSYC 653. Family Counseling and Therapy. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisites: PSYC 616, and PSYC 693 or PSYC 694, and PSYC 645; or permission of instructor. Emphasizes an applied approach to family assessment and therapy. Presents theories and concepts of major approaches to family therapy and general systems issues. Emphasizes techniques of family therapy. Involves participants in role playing, demonstration, films and case discussion.

PSYC 654. Marriage Counseling and Therapy: Theory, Practice and Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in clinical or counseling psychology, or permission of instructor. Surveys major theories of marital interaction and counseling (as distinct from family counseling). Students perform assessment batteries and interviews and practice selected techniques of marital counseling. Participation in a research project, either library, field, or experimental research, is required.

PSYC 655. Community Interventions: Development, Implementation and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Provides an understanding of the concepts community, prevention and promotion and how interventions that adopt such a perspective differ from traditional psychotherapeutic interventions in their goals and targets. Explores how to critically evaluate research related to community and preventive interventions. Emphasizes consideration of issues in designing, implementing and evaluating community intervention projects. Provides opportunities to conduct part of the intervention in a community setting.

PSYC 656. Structured Training Groups. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: permission of instructor. This course presents an introduction to the historical roots and basic assumptions of group training methods. The specific focus is on those structured, behavioral interventions that are designed to be time limited and emphasize staff development or training needs of clients. Needs assessment, screening, program development and evaluation, consultation methods and ethics are included as topics. Leadership styles and the composition of training grant proposals are developed and critiqued in the laboratory/experiential component of this course.

PSYC 657. Advanced Educational Psychology for Secondary Teachers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Application of the principles of psychology to the teaching-learning process in the secondary classroom. Discussion will focus on the comprehensive development of individual learning experiences and educational programs from the point of view of the educator and administrator. Crosslisted as: EDUS 617.

PSYC 659. Seminar in Consultation Psychology. 3 Hours.
Semester course; 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Explores theory and practice of psychological consultation using case materials, readings and individualized projects. Covers conceptual models and role choices available to the consulting psychologist, common phases, principles and practices found in the consultation process and program evaluation and consultation research methods and issues.

PSYC 660. Health Psychology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PSYC 629 and graduate standing in psychology, or permission of instructor. Provides an overview of research in and applications of the principles of behavioral psychology with respect to the fields of medicine, health maintenance and illness. Emphasizes the integration of theoretical research and applied issues in these areas. Surveys major topics in behavioral medicine, including psychophysiological disorders, compliance and adherence with health care regimens, psychological adjustment to illness and pain, behavioral dentistry, pediatric psychology, cardiovascular risk reduction, eating and sleeping disorders, behavioral pharmacology and biofeedback. Explores roles of psychologists.

PSYC 661. Clinical Applications of Health Psychology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Clinical health psychology has emerged as a distinct practice area within professional psychology. It is best defined as the application of psychological assessment and intervention methods to various specialty areas within medicine. These areas include rehabilitation medicine, neurology, geriatrics, transplant medicine, bariatrics, oncology, cardiology, pain management, sleep medicine, reproductive health, pediatrics, gastroenterology and primary care. The course will survey the clinical roles of and intervention and assessment tools used within each of these specialty areas, and will include guest lectures provided by clinicians who work in these specialty areas from the VCU Health System or the larger community. In addition, students will conduct information-gathering telephone interviews with clinicians from around the nation and present their findings in a discussion format. Course evaluation will be based primarily on class discussion, student presentations of interviews and two take-home exams.

PSYC 662. Diagnostic and Behavioral Assessment. 2,3 Hours.
Semester course; variable hours. 2 or 3 credits. Designed to introduce students to the theory and practice of diagnostic and behavioral assessment. The course primarily focuses on the conceptual underpinnings and major methods associated with the diagnostic and behavioral assessment traditions. Emphasis is placed on how these assessment traditions can be used together to guide case conceptualization, monitor treatment progress and outcome, treatment planning, and treatment selection. The course covers psychometric theory, classics assessment controversies and the psychometric strengths and weaknesses of the diagnostic and behavioral assessment approaches. The course ends with a review of risk assessment. The goal of the course is to provide students with the knowledge and skills to critically apply the appropriate assessment strategies to guide clinical work from intake to termination.

PSYC 664. Psychological Needs of Military Service Members and Their Families. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Provides opportunities to understand the psychological needs of both service members and their families -- from pre-deployment through post-deployment -- through presentations by professionals from the Department of Defense, National Guard, VA Medical Center and other military organizations. Explores the impact of psychological trauma and physical injuries on service members' well-being. Emphasizes a review of different interventions and other sources of help available for returning service members and their families. Provides an opportunity to prepare an integrative review of a topic related to a military issue.

PSYC 665. Psychodynamic Approaches to Psychological Treatment. 3 Hours.
Semester course; 3 credits. Prerequisite: permission of instructor. Examines basic principles in conceptualizing and treating clients from a psychodynamic perspective. Theoretical and clinical readings and case materials are used as a basis for an in-depth analysis of psychodynamic theories and practices within a seminar format.

PSYC 666. Crisis Intervention: Theory, Research and Practice. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Review of the development of the concept of psychological crisis and of intervention programs in a range of areas such as sexual assault, natural disasters, telephone hotlines and medical emergencies. Relevant theory and data from community psychology, laboratory and applied research, sociology and psychiatry will be considered.

PSYC 667. Behavior Therapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing in the psychology program or permission of instructor. Emphasizes group and individual approaches to the following general areas: observational techniques; counterconditioning and extinction procedures; techniques of positive and negative control; self-control procedures; use of modeling and role playing as change techniques; behavioral feedback and cueing procedures.

PSYC 668. Interpersonal Psychotherapy: Social Psychological Analysis. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: permission of instructor. Analysis of counseling and psychotherapy as interpersonal influence processes. Applications of social psychological theories and research to the process of therapeutic change; identification of key aspects of the change process and of how these aspects are embodied in current approaches and techniques of counseling and psychotherapy. Emphasis on experimental methods of studying change processes.

PSYC 669. Interpersonal Psychotherapy: Communication Analysis. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: permission of instructor. Theory and research in nonverbal communication. Communication theories of psychotherapy and a communication analysis of key concepts in psychotherapy.

PSYC 670. Seminar in Gestalt Therapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Philosophical basis, historical background, theoretical formulation, techniques and application of Gestalt therapy. Students will have the opportunity to practice and observe the techniques.

PSYC 671. Readings and Research. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 9 credits. Prerequisite: written permission of instructor. Individual study leading to the investigation of a particular problem in a systematic fashion under the supervision of a member of the faculty.

PSYC 673. Topics in Diversity I. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Seminar is designed to provide students with a foundation for understanding, discussing and addressing issues of diversity across multiple contexts in their academic and personal lives. The seminar involves a workshop in August before classes begin and monthly two-hour process-oriented discussions, exercises and videos on issues pertinent to diversity and inclusion in research, clinical work, service and professional development as a graduate student. Graded as pass/fail.

PSYC 674. Topics in Diversity II. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Prerequisite: PSYC 673. Seminar is designed to provide students with a foundation for understanding, discussing and addressing issues of diversity across multiple contexts in their academic and personal lives. The seminar involves monthly two-hour process-oriented discussions, exercises and videos on issues pertinent to diversity and inclusion in research, clinical work, service and professional development as a graduate student and an end-of-year retreat in May to reflect on lessons learned and opportunities for self-improvement. Graded as pass/fail.

PSYC 675. Ethical Principles of Psychology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. A discussion of some of the current problems of interest to psychologists. Particular emphasis on the ethical principles of psychology, and the dilemmas encountered in the teaching, research and applied practice of psychology.

PSYC 676. Personal Awareness in Multicultural Counseling. 3 Hours.
Semester course; 2 seminar hours and 1 hour skills-building component. 3 credits. Prerequisite: graduate standing in the counseling psychology doctoral program or permission of the instructor. Focus on (1) self-awareness regarding cultural issues, (2) knowledge of cultural differences and (3) counseling skills with culturally different clients. This course will provide the theoretical and research knowledge base to complement students' experiential training in multicultural issues. Building on the students' knowledge of Western and non-Western psychology theories and practices, the course will help students in developing a theory of cross-cultural and multicultural counseling. The course will further focus on historical development of multiculturalism and examine existing research in this area.

PSYC 677. Minority Issues in Mental Health. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Prerequisite: graduate standing in psychology or permission of instructor. Presents an overview of issues pertaining to the mental health of visual racial/ethnic groups (VREG) in the United States (i.e., African-Americans, Hispanics, Asian-Americans and Native Americans). Topic areas include research and psychological theories, assessment, diagnosis, ethnic identity acculturation, service utilization, the family, psychotherapy and training issues.

PSYC 679. Culture, Ethnicity and Health. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Enrollment restricted to graduate students in health psychology or by permission of instructor. This course is designed to provide students with a foundation for understanding and addressing health disparities from a psychological perspective. The class will focus on: (a) health disparities from a historical, political, economic, social and environmental perspective; (b) the intersection of race, ethnicity, gender, socio-economic status, sexual orientation and other social factors that may exacerbate disparities; (c) challenges in the measurement of minority health and health disparities; (d) the role of cultural competence in health promotion and disease prevention; and (e) barriers to health care that contribute to disparities.

PSYC 680. Statistics in Psychological Research I. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: an undergraduate psychological statistics course or equivalent within the past three years or successful passage (80 percent or greater) of an undergraduate psychological statistics equivalency test to be completed at VCU. Extensive coverage of multiple regression/correlation analysis with applications in psychology. Survey of applications of multivariate statistical analyses in psychology.

PSYC 681. Statistics in Psychological Research II. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: PSYC 680 or permission of instructor. Will build on PSYC 680 and provide extensive coverage of multiple regression/correlation analysis with applications in psychology. Will provide a survey of applications of multivariate statistical analyses in psychology and will introduce students to recent statistical develpments in the field.

PSYC 682. Advanced Multivariate Methods in Psychology. 3 Hours.
Semester course; 2 lecture and 1 laboratory hours. 3 credits. Prerequisites: PSYC 680 and PSYC 681. The course examines the application of multivariate methods to the analyses of psychological, behavioral and health data. Major emphasis will be given to multivariate analysis of variance and its extensions (analysis of covariance, repeated measures analysis of variance); hierarchical mixed effects models; and factor analysis in its various forms (principal components, exploratory factor analysis, confirmatory factor analysis, path analysis, structural equation modeling).

PSYC 683. Multilevel Modeling. 3 Hours.
Semester course; 2 lecture and 1 laboratory hours. 3 credits. Prerequisites: PSYC 680 and PSYC 681; or two semesters of graduate-level statistics courses. Course introduces a number of expressions of multilevel modeling that are now in common use in all the major branches of psychology, as well as in education and other sciences. The course balances conceptual understanding of MLM with practical application.

PSYC 688. The Self and Identity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PSYC 630 and 680 or permission of instructor. Our sense of self provides meaning and coherence to our lives; it is the lens through which we interpret the world. This seminar will take a research-based approach, and almost all readings will be psychology journal articles. Class will focus on key topics in recent self research (e.g., self-regulation, self-esteem, the self and relationships, different cultural conceptions of self) as well as debate controversial issues in the literature (e.g., the cultural universality of self-enhancement, whether positive illusions are healthy). Students may choose some of the topics covered in the latter part of the semester. Evaluation will be based primarily on class discussion, student-led debates and discussions, and a research proposal and presentation at the end of the semester.

PSYC 690. Research Practicum. 1-3 Hours.
Semester course; 4 hours per credit. 1-3 credits. Available to graduate students in the psychology department with approval by their program committee. Provides the graduate student in psychology the opportunity to design and apply research skills under close faculty supervision. Involves research projects that progressively become more sophisticated as students increase their research skills.

PSYC 691. Special Topics. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for credit. Prerequisite: permission of instructor. Theory, research and techniques in specialized topics of current interest are presented.

PSYC 693. Counseling Practicum. 1-3 Hours.
Semester course; one-half day per credit. 1-3 credits. May be repeated for a maximum of 12 credits. Available only to graduate students in counseling psychology approved by the counseling program committee. A series of training experiences designed to facilitate progressively greater degrees of skill development in counseling psychology.

PSYC 694. Clinical Practicum. 1-3 Hours.
Semester course; one-half day per credit. 1-3 credits. May be repeated for a maximum of 12 credits. Available only to graduate students in clinical psychology approved by the clinical program committee. The graduate student in clinical psychology is given an opportunity to apply and practice interviews and diagnostic and therapeutic skills with clients requiring psychological services. Careful supervision and evaluation of the student is provided. The practicum may be located at a clinic on campus or in a hospital or other agency off campus.

PSYC 695. Practicum in Clinical or Counseling Supervision. 2 Hours.
Semester course; 4 supervisory hours. 2 credits. May be repeated for a maximum of 6 credits. Credits earned do not count as course credits toward the degree. Prerequisites: permission of instructor, enrollment in graduate program in clinical or counseling psychology, completion of 12 hours of clinical (PSYC 694) or counseling (PSYC 693) practicum. This course is an opportunity to develop, apply and practice psychotherapy supervision skills under the direct supervision of clinical or counseling faculty members.

PSYC 696. Internship. 0.5 Hours.
0.5 credit. Prerequisite: approval of the director of the program involved. The internship is one-year, full-time assignment, under supervision, to an agency approved by the student's program committee. Graded S/U/F.

PSYC 700. Grant Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: two graduate courses in statistics or permission of instructor. Students are expected to enter course with a pre-approved topic identified and substantial background reading completed. Focuses on preparing an NIH grant application, using F31-F32 mechanism (predoctoral or postdoctoral National Research Service Award) as a model. Course covers elements of a grant application, details of the grant review process and key features of successful applications. Students prepare a research plan for their own application based upon their current work.

PSYC 702. Causal Analysis for Organizational Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: two graduate courses in statistics or permission of instructor. Focuses on conceptual and statistical issues involved with causal analysis with nonexperimental and experimental data. Course covers basic and advanced confirmatory factor analysis and structural equation techniques, with an emphasis on organizational and psychological applications. Crosslisted as: MGMT 702.

PSYC 791. Advanced Topics in Psychology. 1-6 Hours.
Semester course; 1-6 seminar hours. 1-6 credits. May be repeated with different topics for a total of 12 credits toward graduation. A seminar course for the examination of specialized issues, topics, readings, problems or areas of interest for the field of psychology. This course is open to all doctoral students in psychology. Graded as pass/fail.

PSYC 795. Practicum in the Teaching of College Psychology. 3 Hours.
Semester course; 3 credits. May be repeated. Prerequisites: appointment as a graduate teaching assistant in psychology or permission of instructor. Students develop skills in the design and conduct of undergraduate courses in psychology through observation and supervised experiences: acquaints students with university, college, and department policies and resources in support of instruction; familiarizes students with disciplinary resources; assists students in evaluating personal strengths and weaknesses.

PSYC 798. M.S. Thesis. 1-6 Hours.
1-6 credits. May be repeated.

PSYC 898. Doctoral Dissertation. 1-12 Hours.
1-12 credits. May be repeated.

Rehabilitation and Movement Science (REMS)

REMS 540. Cardiovascular Pathophysiology and Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HPEX 375 and HPEX 440 or equivalents. Presents theoretical principles of electrocardiography and the effects of pharmacological intervention in the treatment of cardiovascular disease. Specific emphasis placed on myocardial ischemia, myocardial infarction and their treatment through exercise rehabilitation protocols. The impact of pharmacological agents on the ECG and on exercise are explored.

REMS 608. Advanced Musculoskeletal Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the structure and function of tissues of the musculoskeletal system. Investigates mechanisms of healing of these tissues and explores the affects of various modalities, altered use and disease on the structure and function of musculoskeletal tissues.

REMS 611. Biomechanics of Human Motion. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Applies knowledge and methods of mechanics in the study of the structure and function of the human body as applied to sport, physical activity and rehabilitation. Topics include kinematics, kinetics and methods of biomechanical analysis.

REMS 612. Advanced Biomechanics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: REMS 611 or permission of instructor. Enrollment restricted to students registered in the REMS program or with permission of instructor. Applies advanced biomechanics techniques to the evaluation and quantification of human performance. Encourages scientific thought with practical applications.

REMS 660. Neuromuscular Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the interrelationships between the musculoskeletal and neuromuscular systems. Includes examination of normal and abnormal biomechanics of the musculoskeletal system, biomechanical factors related to human performance, as well as acute and chronic adaptations of the neuromuscular system. Emphasizes how these principles can be applied to physical training in healthy and diseased populations and treatment and rehabilitation in the sports medicine setting.

REMS 665. Instrumentation in Motion Analysis. 3 Hours.
2 lecture and 2 laboratory hours. 3 credits. Designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Examines theories, principles, and applications of systems used to qualify and characterize movement.

REMS 690. Research Seminar in Rehabilitation and Movement Science. 0.5 Hours.
Seminar course; 0.5 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Presentation and discussion of research reports and topics of interest. Advances skills in critical analysis and discussion leadership. Topics and research presentations vary from semester to semester and are coordinated by the instructor of record. May be repeated. Graded as pass/fail.

REMS 692. Independent Study. 1-3 Hours.
Semester course; 1-3 hours. 1-3 credits. May be repeated for 6 credits. Determination of the amount of credit and permission of the instructor and division head must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in health or movement sciences. Crosslisted as: HEMS 692.

REMS 701. Advanced Exercise Physiology I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501 or other graduate-level mammalian physiology course or permission of instructor. Investigates the effect of acute and chronic exercise stimuli on human performance and select disease states. Topics to be addresses include exercise bioenergetics, metabolic responses to exercise, contributions to substrate selection and utilization during exercise, muscular performance and adaptations to exercise training, cardiovascular adaptation to exercise, aerobic and anaerobic training programs, and effects of training on fitness and performance.

REMS 702. Advanced Exercise Physiology II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHIS 501 or other graduate-level mammalian physiology course or permission of instructor, and REMS 701. Investigates the effect of physiological stressors on human performance and health through lecture and article discussion. Topics to be addressed include exercise in the heat and cold, effects of altitude on physical performance, acute and chronic endocrine responses to exercise, role of adipokines in chronic disease conditions, the use of ergogenic aids in sport.

REMS 703. Cardiovascular Exercise Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. Investigates the structural, functional and cellular principles of human cardiovascular physiology as applied to health and human performance. Emphasis will be placed on the metabolic, contractile and hemodynamic adaptations to acute and chronic exercise training.

REMS 704. Psychobiology of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. "Psychobiology" is defined as the integrative study of behavior from the social, cognitive and biological levels of analysis. This course will include an examination of the research that encompasses psychophysiology, psychoneuroendocrinology, psychoneuroimmunology, neuroscience, physiological psychology and behavioral genetics applied to exercise.

REMS 705. Metabolic Aspects of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. This course is designed to explore the thermic effects of physical activity in apparently healthy individuals, as well as those with increased risk for cardiovascular, metabolic or other inflammatory diseases. Additionally, the relationship between physical activity and food intake, resting metabolic rate and dietary-induced thermogenesis will be reviewed. The examination of gastrointestinal function during dietary manipulation will also be assessed to address performance enhancement in several types of physical activities. This course will emphasize the metabolic control of ATP synthesis, which includes carbohydrate, lipid and protein metabolism and their interaction with one another in response to biological needs during rest and physical activity.

REMS 706. Development and Motor Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to the REMS program or by permission of instructor. Explores theories of developmental motor control and examines theoretical influences on development of infants and young children who are typically developing as well as those with developmental disabilities. Engages students in critical literature review relevant to motor development and rehabilitation and in the application of theory to practice and research design.

REMS 710. Research Techniques in Rehabilitation and Movement Science. 1-3 Hours.
50 hours of laboratory times per credit hour. 1-3 credits. Prerequisite: Permission of instructor required. Examines and explores laboratory techniques used in rehabilitation and movement science research. Provides opportunity to begin transitioning clinical problems to research questions. Opportunities in laboratories of the rehabilitation and movement science program or other laboratories approved by the adviser or program directors. Focuses on individual student learning needs. Graded as pass/fail.

REMS 793. Teaching Practicum in Higher Education. 1 Hour.
50 hours of contact/preparation time for each credit. 1 credit. Practicum designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science degree program. Develops skills necessary for classroom teaching including preparing and presenting selected topic (s), writing test questions, and grading examinations. May be repeated for additional teaching experience. Graded as pass/fail.

REMS 794. Research Presentation Seminar. 1 Hour.
1 lecture hour. 1 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Develops presentation skills. Requires preparation and presentation of research at a public research forum scheduled by the instructor of record. Students are expected to submit their research for presentation at a selected regional, national or international conference in a related field. Graded as pass/fail.

REMS 798. Research in Rehabilitation and Movement Science. 1-12 Hours.
Semester course; 1-12 credits. Research leading to the Ph.D. degree and elective research projects for students in the Rehabilitation and Movement Science doctoral program. May be repeated. Graded as "S," "U" or "F.

Religious Studies (RELS)

RELS 592. Independent Study. 1-4 Hours.
Semester course; 1-4 credits. Determination of the amount of credit and permission of the instructor and department chair must be procured prior to registration for the course. Open only to graduate students. An independent study course to allow qualified graduate students to do research in an area of major interest.

Sociology (SOCY)

SOCY 500. Advanced Principles of Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive analysis of the concepts and techniques useful for understanding society and culture as well as the social processes and structures operant within these spheres.

SOCY 501. The Foundations of Sociological Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The foundations of theoretical explanation of the social world is addressed from an historical and philosophical perspective. The emergence of contemporary sociological theory in the 19th and 20th centuries is reviewed.

SOCY 502. Contemporary Sociological Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A critical assessment is given of such contemporary theoretical orientations as functionalism, conflict theory, exchange theory, symbolic interactionism and phenomenology.

SOCY 508. Introduction to Social Statistics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Introduction to statistical methods applicable in a variety of settings, with emphasis on nonexperimental data. Data description and analysis including chi-square and t-tests, using a statistical computing package. Not applicable toward M.S. in Mathematical Sciences or Computer Science. Crosslisted as: STAT 508.

SOCY 510. Domestic and Sexual Violence in Social Context. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will learn about the experiences of and responses to sexual and domestic violence in specific social contexts, with a focus on less visible contexts and underserved populations. Examines violence within various family structures and intimate relationships including racial/ethnic minority and immigrant groups and gay/lesbian/bisexual/transgender relationships, in various community settings including college campuses and the military, and among people with disabilities. Guest lectures provided by community experts in these areas.

SOCY 515. Globalization and Transformation: Concepts and Realities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines how globalization significantly affects cultural processes at both local and national levels. Transformations of cultural understandings and practices under such circumstances will be explored. Virtual course components will bring causes, processes and consequences of the transformations of Western, Eastern and developing countries into focus. Crosslisted as: INTL 500.

SOCY 524. Aging and the Minority Community. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An analysis of the relationship between the aging process and American minority communities. In addition to the sociological factors, the course will examine demographic, physiological and psychological aspects of minority aging. Attention will also focus on dominant social problems and federal policies toward the aged.

SOCY 525. Digital Social Problems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The study of sociological concepts and methods in the analysis of current social problems in the digital environment, including topics such as privacy, obscurity, hacking, danger, crime and war; interpersonal conflicts and harassment; stress, information overload and FOMO, among others. This course explores how individual online behaviors have the effect of reproducing inequality.

SOCY 593. Internship in Sexual and Domestic Violence Practice and Research. 3 Hours.
Semester course; 12 hours per week. 3 credits. Provides students practical experiences working in settings that address sexual and domestic violence. Students will focus on various areas including but not limited to service provision, intervention, research and program evaluation. Students will work closely with organizations/agency staff and follow their instructions.

SOCY 601. Sociological Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Review of sociological research methodologies, including research design, ethical issues, measurement, data collection techniques, sampling and the basic logic of qualitative and quantitative analysis.. The focus is on developing the student's abilities to critically evaluate uses of methodologies in the research literature and justify methodological choices.

SOCY 602. Applications of Sociological Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SOCY/STAT 508 or equivalent and SOCY 601. Emphasis on applying methods for developing and executing a sociological research project, including the problem statement, theoretical framework, literature review, research design, ethics, sampling, data collection procedures, data analysis and presentation of results.

SOCY 603. Seminar in Population Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analysis of fertility, mortality and migration from a sociodemographic perspective. Special attention will be paid to sociological determinants of demographic processes and their interrelationships.

SOCY 604. Sociology of Work in Industry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyses of work relations and the social structures and mechanisms that govern and arise out of them and examination of the social problems that are inherent in the characteristics that make a society an industrial society.

SOCY 605. Survey Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SOCY 601, SOCY 602 and SOCY/STAT 608, or permission of instructor. Examines all major areas of survey research methodology including sampling, design, data collection methods, questionnaire design, data analysis and data processing. Addresses problems specific to survey research, such as telephone interviewing, constructing large representative samples and nonresponse rates. Crosslisted as: PADM 605.

SOCY 607. Seminar in Racial and Ethnic Relations in America. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of intergroup relations in such areas as busing and school desegregation, racism, minority and athletics, the emergence of white ethnic groups in the political systems, and the position of minorities in legal, economic and medical institutions.

SOCY 608. Statistics for Social Research. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: STAT/SOCY 508 or SOCY 214 or permission of instructor. Statistical methods applied in social research. Topics include analysis of variance, correlation and regression, including stepwise methods, and the analysis of discrete data. Study of a statistical package, emphasizing manipulation of survey data sets. Not applicable toward M.S. in Mathematical Sciences or Computer Science. Crosslisted as: STAT 608.

SOCY 609. Seminar in the Family. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analysis of contemporary family life with an emphasis on the influence of social change. Consideration of current family crises and problems.

SOCY 610. Complex Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of complex organizations in society with emphasis on the determinants and effects of organizational structure and process.

SOCY 611. Studies in the Community. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The organization of the community with emphasis on major trends in urban development and growth. The interdependence of political, social and economic geographic units. The need for cooperative planning and control.

SOCY 612. Seminar in the Sociology of Deviant Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The nature and functions of deviance. Theories and problems of social control.

SOCY 613. Social Stratification. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An in-depth analysis of status differentials in society (e.g., social class, prestige and power).

SOCY 614. Seminar in the Sociology of Education. 3 Hours.
Semester course; 3 lecture hours. A sociological analysis of education as a social institution with an emphasis on methodological issues and policy implications.

SOCY 615. Seminar in Mass Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Some theoretical background in sociology is recommended. A sociological analysis of contemporary media and their interrelationships with social systems, media and national development. Special emphasis on media as instruments of social and cultural change.

SOCY 616. Digital Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course covers the sociological underpinnings of apps, likes, shares, profiles and swipes. Many of the digital tools used in society have become critical points of access for education, health care, government and work. Not all groups have the same access to, experience of and returns to using these tools. Digital sociology is emerging from classic social theory and methods to consider these new technologies and how groups interact with them.

SOCY 620. Seminar in Criminology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination and analysis of social, psychological, and economic theories and correlates of criminal behavior. Typologies of offenders. Crosslisted as: CRJS 620.

SOCY 622. Theory Construction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A consideration of recent social theorists in which emphasis is placed on the logic of theory construction.

SOCY 624. Community and Community Services for the Elderly. 3 Hours.
3 credits. A conceptual/theoretical overview of community focusing on the ecological, psychological and social dimensions of community and on communities of the aged. Crosslisted as: GRTY 624.

SOCY 625. Urban Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing. A detailed analysis and examination of the social and ecological structures and processes of the modern city with primary emphasis on the macro-level organization of urban life.

SOCY 630. Social Psychology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discussion and investigation of selected social psychological issues in sociology, as well as traditional and innovative methodology applied to these issues.

SOCY 631. Battered Women in the Criminal Justice System. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students with an understanding of (1) the major developments and trends in the law related to battered women in the criminal justice system; (2) the role of the various players in the criminal justice system; (3) how child abuse and sexual abuse are treated in the criminal justice system; and (4) battered women who kill and the defense of battered woman syndrome. Introduces the stages of the criminal justice system as it relates to battered women and their children.

SOCY 632. Intimate Partner and Sexual Violence: Medical Practice and Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the sociological perspective on intimate partner and sexual violence as it relates to women's health. Also covers practical responses to violence such as screening, assessment, treatment and referral behaviors of medical providers, as well as policy in the health care setting.

SOCY 633. Application of the Policy Process to Issues of Violence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Offers an interdisciplinary approach to understanding different models of decision-making and the policy process found at all levels of American government. The focus is on the public sector with application to private and nonprofit settings. A six-stage model of policy initiation, selection, implementation, evaluation and termination is presented and explored through the use of case studies and examples of policy initiatives related to domestic violence, sexual assault and youth violence. Prepares students to recognize and understand the key stages of and influences on the policy process and apply them in their current and future work settings.

SOCY 634. Social Contexts of Childhood and Violence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Course will increase awareness and knowledge of children and adolescents as victims of violence, "absorbers" of violence and perpetrators of violence, as well as the victim-perpetrator dichotomy. Course is informed by an interdisciplinary framework to include neuroscience, trauma-informed practice, socioecological model, child development and resiliency. Topics include children and adolescents' experience with domestic violence, sexual violence, physical abuse, neglect, human trafficking, teen-dating violence, violence against LGBTQ youth, school violence, neighborhood/community violence and violence in the media. This highly interactive course will also consider innovative intervention and prevention strategies and discuss relevant policy issues.

SOCY 635. Theorizing Gender Violence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Teaches students to think sociologically and structurally about gender and violence. Familiarizes students with sociological and feminist scholarship and explanatory theories related to preventing and responding to gender violence. Students will learn about the experiences of and responses to sexual and domestic violence in specific social contexts, with a focus on less visible and underserved populations. Guest lectures provided by community experts in these areas. Also examines social policy and research implications of various approaches.

SOCY 640. Seminar in Political Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analysis of structures and processes of political organization. Examination of the creation and management of power, diffusion and regulation of conflict, and the politics of modernization and bureaucratization.

SOCY 645. The Sociology of Health and Illness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of sociocultural factors in health and illness and the influence of social factors on recovery and rehabilitation. Special attention will be paid to the methodology found in current studies.

SOCY 646. Seminar in the Sociology of Mental Health and Disorder. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Seminar in social organizational causes of clinical depression, schizophrenia, neurosis and personality disorders. Focus is on prevention through social engineering and social policy. Impact of social change, sex roles and socialization processes on rates of mental disorder emphasized.

SOCY 650. Theories of Social and Institutional Change. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of social change with emphasis on institutional settings. Topics examined include alternative theoretical perspectives on change, structural sources of change, approaches to planned change, and the role and function of change agents.

SOCY 652. Environmental Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Exploration of the social and political dimensions of human-environment relationships through the lens of environmental sociology and human geography. The course focuses on large-scale, planetary transformations often referred to as climate change, a diverse range of effects that are becoming increasingly salient parts of our everyday lives.

SOCY 654. Political Economy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A rigorous introduction to historical and theoretical modes of inquiry that are foundational to a wide range of critical sociology. An exploration of the major sociological paradigms for analyzing relations among state, economy and society. Topical focus will vary each term, but will include a critical evaluation of liberal political economy, an investigation of 20th century capitalism and the rise of neoliberalism, and the intersections of race, gender and class in the modern world-system.

SOCY 656. Social Network Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing or permission of instructor. Provides a solid introduction to the theoretical foundations, basic measures and common applications of Social Network Analysis. Begins with overview of what it means to practice SNA and discusses the implications and use of SNA as social science methodology. Using online discussions and standard SNA methodological tools, students will engage in peer discussions and complete a series of practica designed to introduce the SNA methodology. Course will also take a broad look at how SNA has been used in understanding social mobility, interpersonal violence and terrorism/gangs. By course end, students will have an understanding of the theories and basic measures and methods of SNA.

SOCY 660. Seminar in the Sociology of Gender. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An analysis of the social construction of gender, the social forces that create and maintain gender hierarchy, and how the gender hierarchy intersects with other systems of inequality such as race, class and sexuality.

SOCY 673. Public Sociology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students an opportunity to reflect on public sociology and develop skills in disseminating their sociological insights to a broader public. Some of the major questions addressed include: What is public sociology? What/who is the sociological audience? What is the relationship between academia and public intellectual life? How does the internet influence the availability of publics? How does style of writing determine our relationship to different publics?.

SOCY 676. Digital Data for the Social Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. To engage with both the possibilities and the critiques of digital data, this course speaks two languages -- sociology and computer science. The course introduces the tools needed for analyzing "native-born" data in order to explain how human behavior both shapes and is shaped by digital data. In order to evaluate the science behind the internet, the way in which computational processing manufactures digital data, and the unique data collection language and tools necessary for accessing digital data, this course is team taught by a sociologist and a computer scientist.

SOCY 690. Practicum in the Teaching of College Sociology. 1 Hour.
Semester course; 1 credit. Enables students to develop skills in the design and conduct of undergraduate courses in sociology through observation and supervised experiences. Credits not applicable toward the B.S. in Sociology.

SOCY 691. Special Topics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Seminars on current specialized areas of sociological and anthropological interest.

SOCY 692. Independent Study. 1-6 Hours.
Semester course; 1-3 credits. A maximum of 6 credits may be submitted toward the master's degree. Prerequisites: permission of instructor and graduate program committee.

SOCY 693. Internship. 1-6 Hours.
Semester course; variable hours (50 contact hours per credit). 1-6 credits. May be repeated for a maximum of 6 credits. Permission of the internship coordinator and graduate director required for enrollment. A graduate-level internship that allows students to explore professional opportunities as related to the discipline of sociology. Students will be required to write a professional paper applying sociological concepts and methodologies to their experiences in the setting, as appropriate.

SOCY 694. Practicum in Sociology. 1-6 Hours.
Semester course; variable hours. 1-6 credits. May be repeated for a maximum of 6 credits. Provides opportunities for training experiences in sociological applications under faculty supervision leading to progressively greater degrees of skill development. Specific experiences offered vary from semester to semester.

SOCY 698. M.S. Thesis. 1-6 Hours.
1-6 credits. May be repeated.

SOCY 699. Seminar in Sociological Practice. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 6 credits. Enrollment restricted to graduate students in the Sociology M.S. program who have completed 18 credit hours in graduate-level (500 and above) sociology courses. The purpose of this course is to professionalize students pursuing multiple forms of sociological practice through interactions with the course instructor and student peers who are undertaking thesis, practicum and internship projects. Students will meet regularly with the course instructor to discuss progress/issues/insights with regard to their projects and topics relevant to sociological practice. Students will make progress on their individual projects in a structured format and present their work at the end of each semester. Graded as S/U/F.

Spanish (SPAN)

SPAN 533. Spanish for the Professions. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be repeated for a maximum of 8 credits. Prerequisites: SPAN 301; SPAN 305 or 307 or 311; SPAN 320 or 321; SPAN 330 or 331; SPAN 404. An intensive study of specialized communication in Spanish. The content of this course will emphasize the knowledge and language skills for particular professions, which may include business, education, health sciences and translation. See the Schedule of Classes for specific topic offered each semester.

SPAN 543. Texts and Contexts in Spain and Latin America. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be repeated for a maximum of 8 credits. Prerequisites: SPAN 301; SPAN 305 or 307 or 311; SPAN 320 or 321; SPAN 330 or 331. Restricted to seniors in Spanish concentration with at least 85 credit hours taken toward the degree. An exploration of themes concerning Spain, Latin America and/or Latinos in the U.S. as reflected in a variety of textual genres, including film.

Statistical Sciences (STAT)

STAT 508. Introduction to Social Statistics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Introduction to statistical methods applicable in a variety of settings, with emphasis on nonexperimental data. Data description and analysis including chi-square and t-tests, using a statistical computing package. Not applicable toward M.S. in Mathematical Sciences or Computer Science. Crosslisted as: SOCY 508.

STAT 513. Mathematical Statistics I. 3 Hours.
Continuous course; 3 lecture hours. 3 credits. Prerequisite: MATH 307. Probability, random variables and their properties, distributions, moment generating functions, limit theorems, estimators and their properties; Neyman-Pearson and likelihood ratio criteria for testing hypotheses. Crosslisted as: BIOS 513.

STAT 514. Mathematical Statistics II. 3 Hours.
Continuous course; 3 lecture hours. 3 credits. Prerequisite: STAT 513/BIOS 513. Probability, random variables and their properties, distributions, moment generating functions, limit theorems, estimators and their properties; Neyman-Pearson and likelihood ratio criteria for testing hypotheses. Crosslisted as: BIOS 514.

STAT 543. Statistical Methods I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing, or those with one course in statistics and permission of instructor. Basic concepts and techniques of statistical methods, including the collection and display of information, data analysis and statistical measures; variation, sampling and sampling distributions; point estimation, confidence intervals and tests of hypotheses for one and two sample problems; principles of one-factor experimental design, one-way analysis of variance and multiple comparisons; correlation and simple linear regression analysis; contingency tables and tests for goodness of fit. Students may receive degree credit for only one of BIOS 543, STAT 441, STAT 541, STAT 543 or STAT 641. Neither STAT 543 nor BIOS 543 is applicable toward the M.S. degree in mathematical sciences or the M.S. degree in computer science.

STAT 544. Statistical Methods II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 305, STAT 314, STAT 441, STAT 541 or STAT 543, or an equivalent. Advanced treatment of the design of experiments and the statistical analysis of experimental data using analysis of variance and multiple-regression. Includes the use of a statistical software package for data analysis. Students may receive degree credit for only one of BIOS 544 or STAT 544.

STAT 546. Linear Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 513 and one applied course in statistics, or permission of instructor. A study of the theory underlying the general linear model and general linear hypothesis. Topics include the general linear model for quantitative responses (including multiple regression, analysis of variance and analysis of covariance), binomial regression models for binary data (including logistic regression and probit models) and Poisson regression models for count data (including log-linear models for contingency tables and hazard models for survival data).

STAT 591. Topics in Statistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisite: Permission of the instructor. Course open to qualified undergraduates. Selected topics in statistics.

STAT 608. Statistics for Social Research. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: STAT/SOCY 508 or SOCY 214 or permission of instructor. Statistical methods applied in social research. Topics include analysis of variance, correlation and regression, including stepwise methods, and the analysis of discrete data. Study of a statistical package, emphasizing manipulation of survey data sets. Not applicable toward M.S. in Mathematical Sciences or Computer Science. Crosslisted as: SOCY 608.

STAT 613. Stochastic Processes. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of instructor. Introduction to the theory and applications of stochastic processes. Random walks, Markov processes, queuing theory, renewal theory, birth-death and diffusion processes. Time series, spectral analysis, filter, autocorrelation.

STAT 614. Stochastic Processes. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of instructor. Introduction to the theory and applications of stochastic processes. Random walks, Markov processes, queuing theory, renewal theory, birth-death and diffusion processes. Time series, spectral analysis, filter, autocorrelation.

STAT 621. Nonparametric Statistical Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: any two courses of statistics or permission of instructor. Estimation and hypothesis testing when the form of the underlying distribution is unknown. One-, two- and k-sample problems. Tests of randomness, Kolmogorov-Smirnov tests, analysis of contingency tables and coefficients of association. Crosslisted as: BIOS 621.

STAT 623. Discrete Multivariate Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Methods for the analysis of categorical data, including logistic regression and the general log-linear model. Emphasis on social and biomedical applications of these techniques using SPSS and SAS software.

STAT 625. Applied Multivariate Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of instructor. Multivariate statistics is a study of dependent random variables. This course covers methods for analyzing continuous multivariate data, such as numerical and graphical summary of multivariate observations, principal component analysis, factor analysis, classification and discrimination, canonical correlation analysis, and cluster analysis. Students will learn the motivation behind these methods, how to implement them in statistical software packages and how to interpret the results.

STAT 626. Complex Sampling Designs and Variance Estimation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 544 and 514. The analysis of data from surveys that use multistage samples, and connections to the analysis of observational studies and experiments with missing data. Computer intensive methodologies such as the jackknife and bootstrap will be introduced and applied to the problem of variance estimation in these diverse settings.

STAT 636. Machine Learning Algorithms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate status in mathematical sciences, systems modeling and analysis, decision sciences and business analytics, or computer science, or by permission of the instructor. Includes an in-depth analysis of machine learning algorithms for data mining, equipping students with skills necessary for the design of new algorithms. Analyses will include framing algorithms as optimization problems and a probabilistic analysis of algorithms. Students will be exposed to current areas of research in the construction of data mining algorithms. Crosslisted as: OPER 636.

STAT 641. Applied Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students who have completed a multivariate calculus course. Experience with mathematics or statistics software is strongly recommended. Introduction to applied data analysis intended primarily for graduate students in mathematical sciences and engineering. Topics include the fundamental ideas of descriptive statistics, elementary probability theory, statistical inference including tests of hypotheses and confidence intervals, ANOVA, principles of experimental design, correlation and linear regression analysis, categorical data analysis, and quality control. Focus is on the practical side of implementing these techniques using statistical software packages. Students may receive degree credit for only one of BIOS 543, STAT 441, STAT 541, STAT 543 or STAT 641.

STAT 642. Design and Analysis of Experiments I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of instructor. An introduction to the design and analysis of experiments. Topics include the design and analysis of completely randomized designs, one variable block designs, the family of Latin square designs and split-plot designs. Introductions are also given to multiple comparison procedures and contrasts, analysis of covariance and factorial experiments. Applications involve the use of a statistical software package.

STAT 643. Applied Linear Regression. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 200-201, STAT 212 and MATH 310 or equivalents. An introduction to the concepts and methods of linear regression analysis. Topics include simple linear regression, multiple linear regression, the impact of model misspecification, model selection criteria, residual analysis, influence diagnostics, diagnostic plots, multicollinearity, transformations and response surface methodology. Applications involve the use of a statistical software package.

STAT 645. Bayesian Decision Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 514 or equivalent. Presents statistical decision theory and Bayesian analysis, with discussions of loss functions, risk, utility, prior information; conjugate families; posterior distributions, estimation, hypothesis testing; empirical and hierarchical Bayes analysis; and robustness.

STAT 648. Systems Reliability Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. An introduction to engineering reliability and risk analysis, specifically failure data analysis, maintenance problems, system reliability and probabilistic risk assessment. Applications in computer science and engineering will include stochastic characterization of wear in hardware systems and the development of failure models for software systems. Decision problems such as the optimal maintenance of repairable systems and optimal testing policies for hardware and software systems will be examined. The analysis of risk through fault trees, event trees and accident precursor analysis also will be discussed. Crosslisted as: OPER 648.

STAT 649. Statistical Quality Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Demonstrates how statistics and data analysis can be applied effectively to process control and management. Topics include the definition of quality, its measurement through statistical techniques, variable and attribute control charts, CUSUM charts, multivariate control charts, process capability analysis, design of experiments, and classical and Bayesian acceptance sampling. Statistical software will be used to apply the techniques to real-life case studies from manufacturing and service industries. Crosslisted as: OPER 649.

STAT 650. Design and Analysis of Response Surface Experiments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Philosophy, terminology and nomenclature for response surface methodology, analysis in the vicinity of the stationary point, canonical analysis, description of the response surface, rotatability, uniform information designs, central composite designs and design optimality. Crosslisted as: BIOS 650.

STAT 675. Time Series Analysis I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate status in mathematical sciences or systems modeling and analysis, or permission of instructor. Analysis of data when observations are not mutually independent, stationary and nonstationary time series, ARIMA modeling, trend elimination, seasonal models, intervention analysis, transfer function analysis, prediction and applications in economics and engineering.

STAT 691. Special Topics in Statistics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Prerequisite: Permission of instructor. A detailed study of selected topics in statistics.

STAT 696. Applied Project. 1-3 Hours.
Semester course; 1-3 lecture hours (to be arranged). 1-3 credits. Up to three credits will be applied to the M.S. in Mathematical Sciences (operations research or statistics concentration) per section. Can be repeated for credit. Prerequisite: SSOR 690 or permission of the faculty adviser. Designed to allow students to apply concepts and theories learned in other courses to a practical situation. Includes the selection, written description, completion and written report of the project and a presentation of the findings. Students may not receive credit for both OPER/STAT 696 and OPER/STAT 698. Graded as Satisfactory/Unsatisfactory. Crosslisted as: OPER 696.

STAT 697. Directed Research. 1-3 Hours.
Semester course; variable hours. 1-3 credits per semester. May be repeated for credit. Prerequisite: Graduate standing. Supervised individual research and study in an area not covered in the present curriculum or in one that significantly extends present coverage. Research culminates with an oral presentation and submission of a written version of this presentation to the supervising faculty member.

STAT 698. Thesis. 1-3 Hours.
Hours to be arranged. 1-3 credits. A total of 3 or 6 credits may be applied to the M.S. in Mathematical Sciences/Statistics. (A total of 3 credits for an expository thesis or a total of 6 credits for a research thesis.) May be repeated for credit. Prerequisite: Graduate standing. Independent research culminating in the writing of the required thesis as described in this bulletin. Grade of "S," "U" or "F" may be assigned in this course.

STAT 725. Advanced Multivariate Statistical Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 625 and STAT 643. This course emphasizes statistical analysis, methodology and theory in modern statistical learning. A variety of multivariate statistical methods, algorithms and software tools will be introduced, with emphasis on conceptual, theoretical and computational aspects. Topics include regularized regression (linear/nonlinear), classification, clustering, sufficient dimension reduction and high dimensional data analysis. Applications involve the use of a statistical software package.

STAT 736. Mathematics of Knowledge and Search Engines. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 541 or equivalent. Investigates the mathematics, methods and algorithms for searching for and extracting structures of interest (knowledge) from large and possibly high-dimensional datasets. The motivation is the rapid and phenomenal growth of the search engine (as demonstrated by Google) as a major tool for search on the Internet, which has impacted commerce, education and the study of social, financial and scientific datasets. The development of the mathematical and statistical learning algorithms behind these search engines has led to advances in how large, high-dimensional datasets can be effectively analyzed for the extraction of knowledge. Crosslisted as: OPER 736.

STAT 742. Design and Analysis of Experiments II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 642. Advanced study of the design and analysis of experiments. Topics include the design and analysis of incomplete block designs, factorial designs, fractional factorial designs, asymmetric factorial designs, blocking in fractional factorial designs, nested designs and response surface designs. Applications involve the use of a statistical software package.

STAT 744. Regression II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 643 or equivalent. Theoretical development and advanced applications of the general linear regression model and nonlinear regression models. Topics include an overview of multiple linear regression, generalized least squares and weighted regression, procedures for diagnosing and combating multicollinearity, advanced model selection criteria, influence diagnostics including multiple observation diagnostics and singular value decomposition, nonlinear regression, Poisson regression, logistic regression, generalized linear models and the exponential family, variance modeling and nonparametric regression. Applications involve the use of a statistical software package.

STAT 745. Advanced Bayesian Statistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 546 and STAT 645 or permission of instructor. Introduces modern aspects of Bayesian methodology. Numerical and sampling techniques such as the Gibbs sampler, importance sampling resampling, Monte Carlo integration, Metropolis-Hastings sampling and adaptive sampling methods. Inferential methods including model selection, highest probability models, Bayesian model averaging, Markov chain Monte Carlo model composition. A large portion of the course will survey the current literature in the areas listed above as well as applications of the methods.

STAT 746. Spatial Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 513 and STAT 643 or permission of instructor. The course will introduce graphical and quantitative analysis for spatial data. Topics include data on fixed-grids, point-referenced data, lattice data, point-pattern data and experimental design for spatial data collection. Students will be expected learn how to program in appropriate software packages.

STAT 775. Time Series Analysis II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 513 and STAT 675, or permission of instructor. Advanced study of time series analysis. Topics include multivariate time series, state-space models and GARCH models. Applications involve the use of a statistical software package.

STAT 791. Special Topics in Statistics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Prerequisitie: permission of instructor. A detailed study of selected advanced topics in statistics.

Statistical Sciences and Operations Research (SSOR)

SSOR 690. Research and Communications Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with nine graduate credits in OPER and/or STAT courses and with permission of the instructor. Designed to help students attain proficiency in professional and academic communication and research in the context of statistics and operations research. The course focuses on the discipline-specific communication and research skills necessary to excel in careers or graduate studies in these disciplines.

Systems Modeling and Analysis (SYSM)

SYSM 681. Systems Seminar I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: graduate standing in mathematical sciences or systems modeling and analysis. Designed to help students attain proficiency in academic communication and research in the context of mathematics, operations research and statistics. Focuses on the discipline-specific communication and research skills necessary to excel in graduate studies in these disciplines.

SYSM 682. Systems Seminar II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: graduate standing in mathematical sciences or systems modeling and analysis. Designed to help students attain proficiency in professional communication and research in the context of mathematics, operations research and statistics. Focuses on the discipline-specific communication and research skills necessary to excel in professional careers in these disciplines.

SYSM 683. Systems Seminar III. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: graduate standing in mathematical sciences or systems modeling and analysis. Designed to help students attain proficiency in literature review and research in the context of mathematics, operations research and statistics. Focuses on the discipline-specific literature review and research skills necessary to write an applied project, thesis or dissertation.

SYSM 697. Systems Research. 3 Hours.
Semester course; 3 credits. May be repeated for credit. Prerequisite: graduate standing in systems modeling and analysis. Supervised individual research and study. Research culminates with an oral presentation and submission of a written report to the supervising faculty member.

SYSM 780. Stochastic Methods in Mathematical Biology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: STAT 513 or STAT 613, and MATH 535. Covers commonly used stochastic methods in mathematical biology, including cellular physiology and related areas. Topics covered include stochastic differential equation models, applications of first passage time (escape time) and applications of density or master equations, diffusion in cells, stochastic ion channel dynamics, and cellular communication. Students will be expected to learn how to program in appropriate software packages.

SYSM 798. Dissertation Research. 1-12 Hours.
Semester course; variable hours. 1-12 credits. May be repeated for credit. Research and work leading to the completion of the Ph.D. dissertation in systems modeling and analysis. Graded S/U/F.

World Studies (WRLD)

WRLD 530. Concepts in World Cinema. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Can be repeated for credit with different themes. Prerequisites: permission of instructor and/or graduate standing. Exploration of aspects of film theory combined with a study of cinema across national traditions and movements. Each semester a different thematic focus is engaged to illuminate issues in film composition and reception. Themes will include: the Holocaust, film and screen theory in the digital era, decolonizing the gaze: Black African and Caribbean cinema.

WRLD 535. World Filmmakers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Can be repeated for credit with different themes. Prerequisites: permission of instructor and/or graduate standing. Centers on the distinct yet interrelated roles of directors (as individual "authors" or as part of a movement or tradition), studios, audiences, national film industries, etc. in the production, development and interpretation of screen media. Each semester a different vantage point, i.e. gender, is used to open new perspectives on film, a critical evaluation of national film traditions and the elements of cinematographic style. Topics include: women filmmakers in world cinema, Spanish and Latin American filmmakers, filmmakers of the "New German Cinema.

WRLD 593. Internship With French Film Festival. 3 Hours.
Semester course; 8 hours per week in festival office during semester and 8 hours per day during festival in Byrd Theatre. 3 credits. Provides students practical hands-on experience working in the French Film Festival office. Students will research and write questions to ask French actors, directors and cinematographers during the festival. The students edit a final audiovisual project of their actor/director interviews. Students work closely with the founders/directors of the French Film Festival.

School of the Arts

Applied Music (APPM)

APPM 585. Opera Theatre. 2 Hours.
Semester course; 1 lecture and 4 studio hours. 2 credits. May be repeated up to four times for credit. Prerequisite: Permission of instructor. Explores aspects of opera through study, written research and fully staged public performances of operatic scenes and/or one-act operas.

APPM 663. Advanced Pedagogy. 1 Hour.
Semester course; 3 lecture hours. 3 credits. Further study in pedagogical systems and techniques with emphasis on materials for intermediate and advanced-level students. Studio observation will be included. Sections: (1) piano, (2) voice, (3) organ, (4) percussion, (5) brass, (6) woodwinds and (7) strings.

APPM 671. Piano Technique Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Physiology of piano playing. Alternative approaches to building and reconstructing technique.

Art Education (ARTE)

ARTE 501. Art Education Elementary Materials and Practicum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the art teacher preparation program. A preparatory experience with observation and participation in art programs in elementary grades prior to student teaching. This course explores art materials, techniques and teaching methods suitable for this level and analyzes evaluation strategies appropriate for art.

ARTE 502. Art Education Secondary Materials and Practicum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the art teacher preparation program. A preparatory experience with observation and participation in art programs in middle school, high school or nontraditional settings prior to student teaching. This course explores art materials and techniques suitable for these levels, examines developmental performance levels and analyzes evaluation methods appropriate for art.

ARTE 508. Two-dimensional Art Experiences. 3 Hours.
Semester course; 2 seminar and 3 studio hours. 3 credits. Not offered for credit for studio art majors. The course explores the media, techniques and concepts of drawing, painting and printmaking.

ARTE 509. Three-dimensional Art Experiences. 3 Hours.
Semester course; 2 seminar and 3 studio hours. 3 credits. Not offered for credit for studio art majors. Exploration of sculptural concepts with three-dimensional materials such as wood, metal, clay, fiber, plaster, plastic and glass.

ARTE 550. Art for the Exceptional Learner. 3 Hours.
Semester course; 2 lecture and 3 laboratory hours. 3 credits. A study of exceptional learners including handicapped, gifted, talented, aged and others, and their participation in and appreciation for the visual arts. Courses may include practicum and field experiences.

ARTE 591. Topics in Art Education. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 9 credits with different topics. The course will explore selected topics of current interests or needs relative to art education. See the Schedule of Classes for specific topics to be offered each semester.

ARTE 592. Independent Study in Art Education. 1-6 Hours.
Semester course; 1-6 credits. Prerequisite: Approval from department chair. Art education majors only. An in-depth study of a selected art education topic.

ARTE 600. Seminar: Issues in Art Education. 3-6 Hours.
Semester course; 3-6 lecture hours. 3-6 credits. The course investigates contemporary issues and identifies problems in art education. Students prepare oral and written reports that explore new directions and discuss the implications for teachers and art programs.

ARTE 601. Elementary Art Education. 3 Hours.
Semester course; 3 lecture and 3 laboratory hours. 3 credits. An inquiry into the nature of art and its importance in the elementary curriculum. Through personal experiences with art concepts and media, students learn about themes, form and expression and develop a broader understanding of the value of art for children.

ARTE 611. Theory and Literature in Art Education. 3 Hours.
Semester courses; 3,3 seminar hours. 3, 3 credits. An introduction to the body of literature and key issues within the field of art education. Students will also develop an overview of the history of art education as well as an understanding of the major roles that theory plays in the crafting of literature within the field, including the roles of conceptual and theoretical frameworks in conducting and consuming research.

ARTE 612. Theory and Literature in Art Education. 3 Hours.
Semester courses; 3,3 seminar hours. 3, 3 credits. An introduction to the body of literature and key issues within the field of art education. Students will also develop an overview of the history of art education as well as an understanding of the major roles that theory plays in the crafting of literature within the field, including the roles of conceptual and theoretical frameworks in conducting and consuming research.

ARTE 665. Curriculum Development and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 6 credits. A review of curriculum development including: needs assessment, determination of goals and objectives, curriculum writing, evaluation, and feedback processes. Theoretical approaches in the visual arts will be studied and curriculum models designed, developed and analyzed.

ARTE 670. Technology in Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The students examine diverse aspects of new technologies in relation to art programs. These aspects include media and computer-assisted learning, and applications of computer graphics and other technology to artistic expression.

ARTE 680. Teaching Laboratory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Observations and experimental teaching experiences with children in art. Group discussions and evaluation of ideas, objectives and methods.

ARTE 690. Issues and Methods of Inquiry in Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Readings and discussions of studies in art education and related research emphasizing possibilities for implementation by art teachers. Methods of research in the field will be reviewed and sample research proposals will be developed by the students.

ARTE 691. Topics in Art Education. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 9 credits with different content. The course will explore selected topics of current interests or needs relative to art education. See Schedule of Classes for specific topic to be offered each semester.

ARTE 692. Independent Study in Art Education. 1-6 Hours.
Semester course; 1-6 credits. Prerequisite: Approval from department chair. Art education majors only. An in-depth study of a selected art education topic.

ARTE 701. Issues in Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Readings and discussions of current issues in art education, art and education. This course emphasizes contemporary issues and research in the field and makes connections between theory and practice.

ARTE 702. History of Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is a survey of the history of art education, its major theories and influences. The emphasis is on the influence of education, art, society and politics on the shaping of art education. While the history of art education from Plato to the present is surveyed, the emphasis is on the past 50 years.

ARTE 703. Contemporary Philosophies and Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Readings and discussions of philosophical writings that affect contemporary art education, art and education.

ARTE 704. Research in Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Advanced readings and discussions of studies in art education. Advanced methods of research in the field will be reviewed and students will develop a beginning dissertation proposal.

ARTE 780. Cultural Diversity in Art and Society. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Recognizing the complex intersections of art, culture and social issues, this course explores the diverse social and cultural landscape in which art is produced. Students will consider recent and historical examples of how policies and social issues have shaped art production in both U.S. and global contexts.

ARTE 799. Thesis. 1,3 Hour.
Semester course; 1 or 3 credits. May be repeated. Prerequisite: completion of all formal course work, candidacy and approval of the department chair. Preparation of a thesis is based upon independent research.

ARTE 800. Advanced Seminar in Art Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum total of 9 credits. The course investigates contemporary issues and identifies problems in art education. Students prepare oral and written reports to explore new directions and discuss the implications for teachers and art programs.

Art History (ARTH)

ARTH 591. Special Topics in Art History. 1-6 Hours.
Semester course; variable hours. 1-6 credits. May be repeated for a maximum of 9 credits. An in-depth study of a particular aspect of art history or art made in a particular time or place, or by a specific artist or group of artists. Course may include extended off-campus trips to sites and collections throughout the United States or abroad. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 598. German for Art Historical Research. 3 Hours.
Semester course. 3 practicum hours. 3 credits. A sustained and progressively complex sequence of exercises in reading and translating art historical research that is written and published in German. Graded P/F.

ARTH 621. Historical Preservation and Architectural History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to the methods or research, record keeping and reporting used in architectural history, and to the evolution of the discipline, especially in relation to historic preservation.

ARTH 622. Studies in Architectural History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 9 credits. An advanced, in-depth study of a selected period of architectural history in Europe and/or America. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 681. Museums and Communities. 3 Hours.
Semester course; 3 seminar hours. 3 credits. An examination of relationships between museums and communities, focusing on critical/theoretical analyses of how museums have constructed community identities, histories of place and cross-cultural relations. Also provides understanding of organizational structures and the roles and responsibilities of museum administrators.

ARTH 682. The Museum as Educational Institution. 3 Hours.
Semester course; 3 seminar hours. 3 credits. An overview of the history, theory and practice of museums as educational institutions, focusing on education philosophies and teaching methods as well as criteria for evaluating the educational merit of exhibits and programs. Also provides an understanding of the roles and responsibilities of museum educators and the structural organization of museum departments of education.

ARTH 683. Museum Collections. 3 Hours.
Semester course; 3 seminar hours. 3 credits. An examination of the history, motivations and procedures of museums collecting. Considers the ethical and logistical issues involved in acquiring objects (through bequests and purchase), in releasing objects (through restitution and deaccessioning) and in stewardship of objects (through conservation and registration). Also provides understanding of the roles and responsibilities of curators, collections managers, registrars and conservators, as well as an understanding of the structural organization of curatorial/collections staff.

ARTH 684. Curating Museum Exhibitions. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Prerequisite: ARTH 681, ARTH 682, ARTH 683 or ARTH 691. Students work collaboratively to develop an exhibit script that reflects a contemporary museological issue through the display of artworks and/or artifacts.

ARTH 690. Historiography and Methodology of Art History. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Historiographic overview of art history since the mid-18th century that provides a foundational understanding of the changing methodological and theoretical bases for its disciplinary practices in academia and museums. Critical reading and writing skills and research methods will be developed through class discussion, small assignments and an independent research project in the student's primary area of interest.

ARTH 691. Special Topics in Museum Studies. 3 Hours.
Semester course; 3 seminar hours. 3 credits. An advanced, in-depth study of museum histories, theories or practices in a particular time period, region or culture.

ARTH 693. Graduate Museum Internship. 3-6 Hours.
Semester course; variable hours. 3-6 credits. May be repeated for a maximum of 9 credits. Prerequisite: permission of instructor, chair of the graduate committee and/or chair of the Department of Art History. Professionally supervised work in a local, regional, national or international museum.

ARTH 694. Art History and Pedagogy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of teaching philosophies and methods that have been enacted in the development of art history curricula, course design, classroom activities and gallery programs within higher education and museum contexts.

ARTH 695. Writing Seminar I. 3 Hours.
Semester course; 3 seminar hours. 3 credits. An investigation and practical application of rhetorical styles of writing for various audiences and purposes in academic, museum and/or online contexts, with particular focus on scholarly writing.

ARTH 721. Seminar in Early Modern Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. An advanced, in-depth study of a selected aspect of Renaissance or Baroque art in Europe. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 722. Seminar in 19th-century Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. An advanced, in-depth study of a selected aspect of 19th-century art in Europe and/or America, including though not limited to movements, artists, new techniques, technologies or display venues. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 723. Seminar in 20th-century Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. An advanced, in-depth study of a selected aspect of 20th-century art in Europe and/or America, including though not limited to movements, artists, new techniques, technologies or display venues. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 725. Seminar in Pre-Columbian Art and Architecture. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. Advanced research on specific topics related to the study of pre-Columbian art in the Mesoamerican and Andean regions. See the Schedule of Classes for specific topics offered each semester.

ARTH 726. Seminar in African Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. A study of the culture and traditional art forms, which may include architecture; sculptural works in wood, stone, ivory and metal; royal attire; jewelry and/or weaponry of a specific African region. See the Schedule of Classes for specific topics offered each semester.

ARTH 727. Seminar in Latin American Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. In-depth study of specific topics related to the study of Renaissance art in the Caribbean, Mexico, Central America or South America. See the Schedule of Classes for specific topics offered each semester.

ARTH 728. Seminar in Asian Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 12 credits. An advanced, in-depth study of a selected aspect of the art of India, Southeast Asia or the Middle East. See the Schedule of Classes for specific topics to be offered each semester.

ARTH 741. Seminar in Art and Theory. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 9 credits. An advanced, detailed investigation of critical, aesthetic or social theories as they relate to the history of art. See the Schedule of Classes for specific topics offered each semester.

ARTH 742. Seminar in Trans-millennial Art and Ideas. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 9 credits. An advanced, detailed investigation of an issue, idea or topic that transcends millennia in the history of art. See the Schedule of Classes for specific topics offered each semester.

ARTH 743. Seminar in Art and Representation. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 9 credits. An advanced, detailed investigation of an issue, idea or topic that considers artworks as representations of people, places, ideas, cultural values, etc. See the Schedule of Classes for specific topics offered each semester.

ARTH 749. Seminar in Diasporic Art. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 6 credits. An examination of African-inspired cultural and artistic traditions in North and South America and the Caribbean. See the Schedule of Classes for specific topics offered each semester.

ARTH 771. Writing Seminar II. 3 Hours.
Semester course; 3 seminar hours. 3 credits. Prerequisite: ARTH 695. Provides Master of Arts students with a structure in which to complete a qualifying paper that fulfills degree requirements. Students meet periodically as a group while also working independently with a faculty adviser to articulate a paper topic, conduct research and refine a paper of publishable quality.

ARTH 772. Major Field Exam. 3 Hours.
Semester course; 3 research hours. 3 credits. Enrollment requires permission of director of graduate studies. Provides doctoral students with opportunities to investigate research areas related to their major field of study. Students work with a faculty adviser to establish a bibliography for independent reading and study in preparation for the major field exam. Graded as Pass/Fail.

ARTH 773. Minor Field Exam. 3 Hours.
Semester course; 3 research hours. 3 credits. Enrollment requires permission of director of graduate studies. Provides doctoral students with opportunities to investigate research areas related to their minor field of study. Students work with a faculty adviser to establish a bibliography for independent reading and study in preparation for the minor field exam. Graded as Pass/Fail.

ARTH 774. Dissertation Proposal. 3 Hours.
Semester course; 3 research hours. 3 credits. Enrollment requires permission of director of graduate studies. Students prepare a dissertation proposal under the direction of the dissertation adviser. Graded as S/U/F.

ARTH 791. Special Topics in Art History. 3 Hours.
Semester course; 3 seminar hours. 3 credits. May be repeated for a maximum of 9 credits. An in-depth investigation of a topic or issue in art history. See the Schedule of Classes for specific topics offered each semester.

ARTH 797. Directed Research Project. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisite: permission of instructor, director of graduate studies and chair of the Department of Art History. Advanced individual work on a subject to be formulated by the student in collaboration with and/or approved by the instructor.

ARTH 899. Dissertation Research. 1-6 Hours.
Semester course; variable hours. Variable credit. A minimum of 6 semester hours required; may be repeated for a maximum of 15 credits. Enrollment restricted to students who have achieved Ph.D. candidacy. Preparation of a dissertation based on independent research and in consultation with a faculty dissertation director. Graded S/U/F.

Arts (ARTS)

ARTS 591. Special Topics. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be repeated with different topics for a maximum of 6 credits. Prerequisite: approval of the instructor. Topical course offering a variety of subjects that are not offered as a part of the standard curriculum of any individual department within the School of the Arts. See the Schedule of Classes for specific topics to be offered.

ARTS 592. Individual Projects/Fieldwork. 1-6 Hours.
Semester courses; 1-6 credits. By appointment with director of graduate studies after approval by department chair. (Obtain individual research project form from the dean's office prior to enrollment.) Individual work for graduate students.

ARTS 601. Seminar in Art. 3 Hours.
Continuous courses; 3-3 credits. Discussion and research in the visual arts providing experience and involvement in the various studio areas for students not concentrating in these areas.

ARTS 602. Seminar in Art. 3 Hours.
Continuous courses; 3-3 credits. Discussion and research in the visual arts providing experience and involvement in the various studio areas for students not concentrating in these areas.

ARTS 690. Methods of Art Research. 2 Hours.
Semester course; 2 credits. Review of selected research methods relevant to the composition of a thesis in the student's master's degree area. Preparation of a proto-thesis concludes course work.

ARTS 692. Individual Projects/Fieldwork. 1-6 Hours.
Semester courses; 1-6 credits. By appointment with director of graduate studies after approval by department chair. (Obtain individual research project form from the dean's office prior to enrollment.) Individual work for graduate students.

ARTS 705. Research in the Arts. 3 Hours.
Semester courses; 3, 6 credits. By appointment with director of graduate studies after approval by department chair. (Obtain individual research project form from the dean's office prior to enrollment.) Individual research for graduate students.

ARTS 706. Research in the Arts. 6 Hours.
Semester courses; 3, 6 credits. By appointment with director of graduate studies after approval by department chair. (Obtain individual research project form from the dean's office prior to enrollment.) Individual research for graduate students.

Craft and Material Studies (CRAF)

CRAF 591. Special Topics and Practicum. 1-3 Hours.
Semester course; 1-3 credits. May be repeated. Prerequisite: permission of instructor. A topical seminar/workshop offered in a variety of craft subjects or issues not included in the regular curriculum. See the Schedule of Classes for specific topics to be offered each semester.

CRAF 601. Graduate Studies in Metal. 3-9 Hours.
Semester course; 9, 18 or 27 studio hours. 3, 6 or 9 credits. May be repeated for a maximum of 36 credits. Personal investigation of materials, processes and attitudes relating to the creative production of metal and/or jewelry forms.

CRAF 621. Graduate Studies in Wood. 3-9 Hours.
Semester course; 9, 18 or 27 studio hours. 3, 6 or 9 credits. May be repeated for a maximum of 36 credits. Design, research and experimentation in wood and varied materials relating to a body of work demonstrating the student's mastery of ideation and material.

CRAF 641. Graduate Studies in Clay. 3-9 Hours.
Semester course; 9, 18 or 27 studio hours. 3, 6 or 9 credits. May be repeated for a maximum of 36 credits. Problems in the design and production of functional and nonfunctional ceramic objects as well as study of experimentation in ceramic technology and kiln design.

CRAF 651. Graduate Studies in Glass. 3-9 Hours.
Semester course; 9, 18 or 27 studio hours. 3, 6 or 9 credits. May be repeated for a maximum of 36 credits. This course is an intensive focus on glass experimentation and its associative properties with the expected outcome of the materialization and realization of each individual’s original research into their studio practice.

CRAF 661. Graduate Studies in Fiber. 3-9 Hours.
Semester course; 9, 18 or 27 studio hours. 3, 6 or 9 credits. May be repeated for a maximum of 36 credits. Work in contemporary and traditional textile techniques.

CRAF 680. Graduate Critique. 3 Hours.
Semester course; 9 studio hours. 3 credits. May be repeated for a maximum of 12 credits. This course explores the meaning and application of critique as it is relates to both students’ own work and the work of others as preparation for thesis or candidacy exhibitions. There will be emphasis placed on the production and presentation of artwork and artist statements.

CRAF 681. Candidacy Research. 3 Hours.
Semester course; 9 studio hours. 3 credits. May be repeated for a maximum of 6 credits. This course will provide directed studio work and research. Students will take risks, hone skills, figure out what questions, issues and ideas direct creative work and receive guidance and support from their graduate committee. To be taken the first two semesters of graduate program; in the second semester the student will work with their graduate committee to prepare for candidacy review and exhibition.

CRAF 682. Thesis Research. 3 Hours.
Semester course; 9 studio hours. 3 credits. May be repeated for a maximum of 6 credits. This course will provide directed studio work and research. Students will take risks, hone skills, figure out what questions, issues, and ideas direct creative work and receive guidance and support from the their graduate committee. To be taken the final two semesters of graduate program with approval of the department chair and graduate committee; in the second semester the student will work with their graduate committee to prepare for thesis exhibition and the written thesis according to the established written thesis timeline.

CRAF 690. Graduate Seminar. 1,3 Hour.
Seminar course; 1 or 3 lecture hours. 1 or 3 credits. May be repeated. Degree requirement for graduate students in the Department of Crafts. A weekly seminar for the purpose of discussing contemporary issues in the arts as they affect the artist-craftsperson.

CRAF 692. Directed Research. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 12 credits. Approval of supervising faculty member and department chair necessary prior to registration. This course will be limited to graduate students in the Department of Craft and Material Studies in high standing within the program. Learning experiences will be designed with the supervising faculty member in the form of a contract between student and instructor.

Design (DESI)

DESI 510. Materials and Methods Studio. 3 Hours.
Semester course; 6 studio hours. 3 credits. Prerequisite: permission of program director. Studio course that develops skills in the use of materials, methods and technologies relevant to a broad range of activities pertaining to design.

DESI 511. Studio in Digital Design and Fabrication Technology. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisite: permission of program director. A studio-based examination of design research methods with emphasis placed on new technology of three-dimensional digital design and fabrication. The studio will utilize recently installed and existing facilities, faculty and resources at Digital Fabrication Lab at VCUQatar.

DESI 512. Studio in Visual Communications. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisite: permission of program director. A studio-based examination of design research methods with emphasis placed on time-based media production. The course is designed to provide a lab/studio opportunity for students to develop media skills while focusing on individual production, collaborative projects and critical discussion. The studio will utilize recently installed and existing facilities, faculty, and resources at Media Lab at VCUQatar.

DESI 520. Design Research Methodologies. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisite: permission of program director. A studio-based examination of design research methods with emphasis placed on linking knowledge, comprehension and application of historic and emerging methods of experimentation to generative and iterative studies.

DESI 601. Interdisciplinary Design Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A seminar to examine the theories and practices related to the contemporary designer's role in the technological, psychological, cultural and aesthetic environment. The seminar will include exploration of historical and contemporary art, architecture, communications, cultural theory and design criticism. The course involves intensive professional debate of various aspects of interdisciplinary design practice, ongoing group discussion, and exercises in critical writing. Professionals at the university and outside of the university will be invited for participation.

DESI 605. Design Strategies and Ethics for Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An investigation of precedents and potentials for application of design methods and processes to the development of business strategies and ethics.

DESI 611. Design Studio One. 6 Hours.
Semester course; 12 studio hours. 6 credits. A topical studio focusing on research, experimentation and problem-solving methods from a cross section of design disciplines.

DESI 612. Design Studio Two. 6 Hours.
Semester course; 12 studio hours. 6 credits. Studio course focusing on interdisciplinary, team-based approaches to identifying and solving advanced design problems.

DESI 613. Design Studio Three. 6 Hours.
Semester course; 12 studio hours. 6 credtis. Prerequisites: successful completion of 30 credits of graduate study and permission of the program director. Studio course focusing on experimentation, analysis and development of creative projects that directly contribute to a design brief to be used as a basis for the final thesis.

DESI 620. Design Thesis Research and Formulation. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisites: successful completion of 30 credit hours of graduate study and permission of the program director. Students examine applied research methods with emphasis placed on comprehension and analysis of case studies and then apply design research methods to test original proposals in a studio environment. Through development of design processes, students define an individual or team project of complex scope and intensity.

DESI 621. Design Research Studio: Leadership and Entrepreneurship. 3 Hours.
Semester course; 1 lecture and 6 studio hours. 3 credits. Prerequisites: successful completion of 30 credit hours of graduate study and permission of the program director. Students evaluate emerging leadership methodologies by applying lessons from case studies and emerging fields of knowledge. Course provides collaborative and presentation opportunities.

DESI 630. Teaching Practicum in Design. 3 Hours.
Semester course; 1 lecture and 6 practicum hours. 3 credits. Prerequisite: completion of 18 credit hours of graduate study. Exploration of philosophical, informational and technical aspects of design education. Observation, instruction and practice in teaching. Topics include effective teaching strategies, curriculum development, learning styles and evaluation techniques. Graded as P/F.

DESI 631. Design Internship. 3 Hours.
Semester course; 1 lecture and 6 studio hours. 3 credits. Prerequisites: successful completion of 30 credit hours of graduate study and permission of the program director. Provides supervised practical work experience that is coordinated with professional designers under the guidance of the design faculty. Internship placement is based upon research interest. Graded as P/F.

DESI 690. Thesis Studio. 1-9 Hours.
Semester course; vairable hours (2 studio hours per credit; 1 seminar hour per 3 credits). 1, 3, 6 or 9 credits. Prerequisites: successful completion of 30 credit hours of graduate study and permission of the program director. This course will support and assist the student in the development and completion of the final thesis project. Executed under the supervision of a graduate adviser and review committee. Graded as S/U/F.

DESI 692. Interdisciplinary Design Research/Individual Study. 1-3 Hours.
Semester course; 3-9 studio hours. 1-3 credits. May be repeated. The structuring, research, execution and presentation of an independent project in interdisciplinary design under the guidance of a faculty member.

Graphic Design (GDES)

GDES 567. Visual Interface Design. 4 Hours.
Semester course; 3 lecture and 3 studio hours. 4 credits. Prerequisite: Permission of instructor. A course concentrating on the visual design and development of human-computer interface systems. Emphasis is placed on visual design processes and methods in the diverse arena of user interface design.

GDES 591. Advanced Studio Topics in Visual Communications. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisite: permission of instructor. May be repeated for a maximum of 6 credits. Topical studio focusing on research and experimentation in specialized visual communication media.

GDES 593. Visual Communications Internship. 3,6 Hours.
Semester course; 3 or 6 credits. May be repeated to a maximum of 6 credits. Prerequisite: Permission of chair required. Supervised study in cross-disciplinary visual communications research projects to integrate theory with practice. Training is provided under the direction and supervision of qualified professional practitioners and a faculty adviser.

GDES 610. Visual Communications Workshop. 4 Hours.
Semester course; 3 lecture and 3 studio hours. 4 credits. Prerequisite: permission of the graduate director. A studio course focusing on the philosophical, communicative and aesthetic relationships of visual communications problem-solving and the effective articulation of concepts.

GDES 611. Visual Communications Workshop. 4 Hours.
Semester course; 3 lecture and 3 sutdio hours. 4 credits. May be repeated for a maximum total of 16 credits. Prerequisite: permission of the graduate director. A studio course focusing on the philosophical, communicative and aesthetic relationships of visual communications problem solving and the effective articulation of concepts.

GDES 612. Research Methods in Visual Communications. 4 Hours.
Semester course; 3 lecture and 3 studio hours. 4 credits. Prerequisite: permission of program director. A studio-based examination of design research methods with emphasis place on linking knowledge, comprehension and application of historic and emerging methods of experimentation to generative and iterative studies. The course culminates in the writing and presentation of a research proposal for the second year of study.

GDES 621. Visual Communications Seminar. 4 Hours.
Semester course; 4 lecture hours. 4 credits. May be repeated. A detailed examination of selected theoretical, historical, aesthetic and social areas of concern to the designer. Scholarly research, critical analysis and discussion are expected.

GDES 631. Visual Communications Teaching Practicum. 3 Hours.
Semester course; 1 lecture and 6 practicum hours. 3 credits. Prerequisite: Permission of department chair. Observation, instruction, and practice to develop skills in the design, organization, and conduct of courses in visual communications. Explores multiple teaching strategies, student development, learning styles, and evaluation techniques.

GDES 692. Visual Communications Research/Individual Study. 3 Hours.
Semester course; 6 studio hours. 3 credits. May be repeated. The structuring, research, execution, and presentation of an independent project in visual communications under the guidance of a faculty adviser.

GDES 698. Research Documentation and Exhibition Design. 3 Hours.
Semester course; 2 lecture and 3 studio hours. 3 credits. Prerequisite: permission of program director. A studio-based course focusing on the design and production of final research documentation in both book and exhibition formats.

GDES 699. Directed Thesis Research in Visual Communications. 1-8 Hours.
Semester course; variable hours (three studio hours per credit). 1, 4 or 8 credits. May be repeated for a maximum of 12 credits. Prerequisites: successful completion of 30 credit hours of graduate study and permission of department chair. Supervised investigation and presentation of selected problems in visual communications. Executed under the supervision of a graduate adviser and review committee.

Interior Design (IDES)

IDES 500. Art and Design Methods Workshop. 3 Hours.
Semester course; 1 lecture and 4 studio hours. 3 credits. May be repeated for a total of 12 credits. Open only to first-professional track graduate students in interior environments. Provides accelerated instruction in art and design methods for the student with no art background by fully immersing the student in a rigorous studio environment. Focuses on the development of 2-D and 3-D art and design skills including 2-D design methods, 3-D design methods, color theory, and drawing and presentation methods.

IDES 501. Introductory Graduate Design Studio I. 6 Hours.
Semester course; 2 lecture and 8 studio hours. 6 credits. Corequisite: IDES 511. Open to professional entry-level track graduate students in interior environments only. Provides accelerated studio and graphics instruction for designing interior environments for the entering professional entry-level track student that does not have previous experience in interior design. Introduces theories, methods and processes of interior design, facilitates specific interior design applications and focuses on analysis and evaluation of interior environments. Course work is highly sequenced and accelerates in complexity as the semester progresses and combines the development of technical skills with conceptual thinking and design development processes. Course emphasizes interior design development through studio projects and the development of the skills and practices of interior design.

IDES 502. Introductory Graduate Design Studio II. 6 Hours.
Semester course; 2 lecture and 8 studio hours. 6 credits. Corequisite: IDES 512. Open to professional entry-level track graduate students in interior environments only. Provides accelerated studio and graphics instruction for designing interior environments for the entering professional entry-level track student that does not have previous experience in interior design. Introduces theories, methods and processes of interior design, facilitates specific interior design applications and focuses on analysis and evaluation of interior environments. Course work is highly sequenced and accelerates in complexity as the semester progresses and combines the development of technical skills with conceptual thinking and design development processes. Course emphasizes interior design development through studio projects and the development of the skills and practices of interior design.

IDES 511. Introductory Graduate Graphics I. 3 Hours.
Semester courses; 1 lecture and 4 studio hours. 3 credits. Corequisite: IDES 501 for IDES 511, IDES 502 for 512. Open to professional entry-level track graduate students in interior environments only. Provides accelerated manual and computer graphics instruction for designing interior environments for the entering professional entry-level track student who does not have previous experience in interior design graphics. Course work is highly sequenced and accelerates in complexity as the semester progresses.

IDES 512. Introductory Graduate Graphics II. 3 Hours.
Semester courses; 1 lecture and 4 studio hours. 3 credits. Corequisite: IDES 501 for IDES 511, IDES 502 for 512. Open to professional entry-level track graduate students in interior environments only. Provides accelerated manual and computer graphics instruction for designing interior environments for the entering professional entry-level track student who does not have previous experience in interior design graphics. Course work is highly sequenced and accelerates in complexity as the semester progresses.

IDES 521. Advanced Material Studies for Interior Environments. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open only to first-professional track graduate students in interior environments. Investigation, selection and practical application of materials and textiles in interior environments.

IDES 522. Environmental Factors for Interior Environments. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open to first-professional track students only. Contemporary theories and techniques in the design of buildings as related to interior design, small structural considerations, HVAC, acoustics, plumbing and the attributes of building materials.

IDES 591. Topics in Interior Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated. Prerequisite: Consent of instructor. Explores selected topics of current and relevant interest in interior design. Topics will vary each semester and focus on the needs of the student.

IDES 601. Graduate Interior Environments Studio. 6 Hours.
Semester course; 12 studio hours. 6 credits. May be repeated twice. Open to graduate students in interior environments; graduate students from other School of the Arts graduate programs may enroll with the consent of the instructor. Prerequisites: IDES 501, 502, 511, 512 for professional entry-level students; none for post-professional students. Provides advanced studio for designing in specialized areas of interior environments. Topics will vary each semester.

IDES 611. Advanced Graphics for Interior Environments I. 2 Hours.
Semester course; 4 studio hours. 2 credits. Open only to first-professional track graduate students in interior environments. Provides advanced graphics instruction for designing interior environments for the first-professional track student. Course work is highly sequenced and accelerates in complexity as the semester progresses and focuses on the development of technical drawing, rendering and presentation skills for the interior designer.

IDES 612. Advanced Graphics for Interior Environments II. 2 Hours.
Semester course; 4 studio hours. 2 credits. Open only to first-professional track graduate students in interior environments. Provides advanced graphics instruction for designing interior environments for the first-professional track student using the computer. Course work is highly sequenced and accelerates in complexity as the semester progresses and focuses on the development of computer-based skills and programs such as AutoCAD, 3-D Viz and Form Z.

IDES 623. Advanced Design Studies. 3,6 Hours.
Semester course; 3 or 6 lecture/seminar hours. 3 or 6 credits. May be repeated. Prerequisites: IDES 501, 502, 511, 512 for professional entry-level students; none for post-professional students. Interior design majors only. Supervised investigation and presentation of selected problems and issues in interior design.

IDES 624. Advanced Furniture Design. 2 Hours.
Semester course; 4 studio hours. 2 credits. For first-professional track students only. Advanced study of furniture design and custom millwork as related to the design of interior environments. Original student designs are developed through the study of structure and materials.

IDES 626. Advanced Light and Color for Interior Environments. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open only to first-professional track graduate students in interior environments. The study of illumination and its impact on people in interior spaces; theory and practical applications.

IDES 631. Ethics and Business Procedures for Interior Environments. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open only to first-professional track graduate students in interior environments. Advanced study of the interior design profession as related to professional and business practices including: responsibilities, services, ethics, business and project management, and marketing.

IDES 635. Teaching Practicum in Interior Environments. 3 Hours.
Semester course; 1 lecture and 6 laboratory hours. 3 credits. Prerequisite: Completion of one graduate studio. Familiarizes students with different types of teaching methods and practices in interior design curriculums. Observation, instruction and practice in the design, organization, and conduct of courses in interior design. Explores multiple teaching strategies, student development, learning styles and evaluation techniques.

IDES 651. History and Theory of Interior Environments I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open only to first-professional students. Study of the major paradigms, theories and styles of the built environment (interior design, furniture and architecture) from antiquity to the late-19th century.

IDES 652. History and Theory of Interior Environments II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Study of the major paradigms, theories and styles of architecture, interior environments and furniture from the beginnings of modernism to the present day.

IDES 690. Graduate Seminar in Interior Environments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A detailed selected investigation of theoretical, historical, aesthetic and social areas of concern to the interior designer. Scholarly research, critical analysis and discussion are expected. The course requires investigative work using resources such as library and archive materials, journals, Internet sources, surveys, oral histories, interviews, case study design, and field documentation and evaluation.

IDES 692. Independent Study in Interior Environments. 1-6 Hours.
Semester course; 1-6 lecture hours. 1-6 credits. May be repeated for a maximum of 6 credits. Interior environments majors only. Prerequisite: approval from department chair. An in-depth study of a selected interior design topic.

IDES 693. Interior Design Internship. 3,6 Hours.
Semester course; 6, 8 or 12 studio hours. 3, 4 or 6 credits. Prerequisite: Consent of instructor. Interior design majors only. Provides supervised practical work experiences that are coordinated with professional interior designers under the guidance of interior design faculty. Formal arrangements must be made. Graded P/F.

IDES 699. Creative Project - Thesis. 1-6 Hours.
Semester course; 2, 6 or 12 studio hours. 1, 3 or 6 credits. May be repeated. Prerequisite: Approval of Departmental Review Committee. The project must test an original design theory synthesized through the development of a design process, investigative research and an individual project of complex scale and scope.

IDES 800. Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status and permission of chair. Explores the foundation and procedures of architectural and design research. Evidence-based design, alternate research methodologies and their philosophical and epistemological limitations.

IDES 801. Theories of Art and Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status and permission of chair. Development of art, architectural and design theories from antiquity to present. Emphasis is on the writings of contemporary leading theorists and historians. Students will apply these theories to contemporary current solutions as related to the creation of a healing environment; or students may explore the history of medicine or healing as expressed in the fine and applied arts.

IDES 811. Interdisciplinary Health Care Design Workshop I. 3 Hours.
One-week workshop. 3 credits. Prerequisites: graduate status and permission of chair. Contemporary issues in health care professions, health care design and environmental stewardship. Course consists of a one-week workshop that offers lectures from leading experts on a selected issue and an interdisciplinary design problem. Students receive reading assignments to be completed prior to the workshop. After the workshop, during exam week, students meet to present their solution to the design problem to the class and invited guest critics. Students also complete an original research paper on the design problem.

IDES 812. Interdisciplinary Health Care Design Workshop II. 3 Hours.
One-week workshop. 3 credits. Prerequisites: IDES 811, graduate status and permission of chair. Contemporary issues in health care professions, health care design and environmental stewardship. Course consists of a one-week workshop that offers lectures from leading experts on a selected issue and an interdisciplinary design problem. Students receive reading assignments to be completed prior to the workshop. After the workshop, during exam week, students meet to present their solution to the design problem to the class and invited guest critics. Students also complete an original research paper on the design problem.

IDES 820. Selected Topics in Health Care Design I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate status and permission of chair. Selected topics in health, health care design and health care administration.

IDES 821. Selected Topics in Health Care Design II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: IDES 820 and graduate status. Continued exploration of selected topics in health, health care design and health care administration.

IDES 899. Dissertation. 3-12 Hours.
Variable hours. 3-12 credits. May be repeated for credit. Prerequisite: ABD status. Research and work leading to the completion of the dissertation thesis or dissertation project. Graded S/U/F.

Kinetic Imaging (KINE)

KINE 500. Graduate Studio. 8 Hours.
Semester course; 16 lab/studio hours. 8 credits. May be repeated for a total of 16 credits. Prerequisite: admission to the kinetic imaging track of the MFA in Fine Arts program or permission of graduate adviser. Emphasis on individual creative production focusing on video, animation and sound, with periodic exposure of student's work and ideas to the critical attention of the teaching faculty of the Department of Kinetic Imaging. Degree requirement for first-year graduate students in department.

KINE 510. Foundations in Media. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the kinetic imaging track of the MFA in Fine Arts program or permission of graduate adviser. A seminar focusing on a historical overview of media arts, including video art, experimental animation, sound art, performance, installation and critical theory. Designed to equalize the base of knowledge among graduate students from various backgrounds and levels of familiarity with issues in contemporary media.

KINE 591. Topics in Contemporary Media. 3 Hours.
Semester course; 3 lab/studio hours. 3 credits. May be repeated for a maximum of 12 credits. Prerequisite: admission to the kinetic imaging track of the MFA in Fine Arts program or permission of graduate adviser. Explores selected topics of current interests or needs relative to digital media. See the Schedule of Classes for specific topic to be offered each semester.

KINE 600. Graduate Studio. 8 Hours.
Semester course; 16 lab/studio hours. 8 credits. May be repeated for a total of 16 credits. Prerequisite: KINE 500. Emphasis on individual creative production focusing on video, animation and sound, with periodic exposure of student's work and ideas to the critical attention of the teaching faculty of the Department of Kinetic Imaging. Degree requirement for second-year graduate students in the department.

KINE 690. Graduate Seminar. 4 Hours.
Semester course; 4 lecture hours. 4 credits. May be repeated for a total of 12 credits. Prerequisite: admission to the kinetic imaging track of the MFA in Fine Arts program or permission of graduate adviser. Weekly seminar for the purpose of exploring recent developments in media and conducting critiques in which students can discuss the ideas and attitudes manifest in their work. Degree requirement for graduate students in the Department of Kinetic Imaging.

KINE 691. Independent Study. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be repeated for a maximum of 12 credits. Prerequisite: permission of instructor and kinetic imaging area head. Students will pursue advanced, individually directed study under the guidance of a faculty adviser. Includes project research, creative execution and presentation.

KINE 692. Graduate Seminar. 4 Hours.
Semester course; 4 lecture hours. 4 credits. May be repeated for a total of 12 credits. Prerequisite: admission to the kinetic imaging track of the M.F.A. in Fine Arts program or permission of a kinetic imaging graduate adviser. Weekly seminar for the purpose of exploring artistic developments and critical issues in media. Provides students with critical evaluation of their work in relation to contemporary practice while focusing on their final thesis exhibition. Degree requirement for graduate students in the Department of Kinetic Imaging.

KINE 695. Advanced Sound. 3 Hours.
Semester course; 3 lab/studio hours. 3 credits. May be repeated for a total of 12 credits. Prerequisite: experience with mulitchannel sound software such as Pro Tools. Focuses on sound as a medium and its connection to animation and video. Designed as an advanced studio course where students develop their own aesthetic in sound and explore creative possibilities. Expands on recording and mixing techniques with a particular focus on 5.1 surround sound mixing for video, animation and sound art.

Music Education (MUED)

MUED 583. Special Workshop in Music Education. 0.5-3 Hours.
Semester course; 0.5-3 credits. Flexible term courses on selected aspects of music education. See the Schedule of Classes for specific topics to be offered each semester.

MUED 591. Topics in Music Education. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits with different topics. Flexible semester courses in selected topics in music education philosophy, curriculum, integrated and interdisciplinary arts, technology and selected topics of current interest or needs relative to music education. See the Schedule of Classes for specific topics to be offered each semester.

MUED 600. Seminar in Music Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated up to two times with different topics. Investigation of contemporary issues and problems in music education. Students will present oral reports and written papers, which explore new directions and implications for music educators and music education programs.

MUED 604. Choral Conducting and Rehearsal Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will seek to develop the skills of the choral conductor in rehearsal and performance. Instruction in rehearsal technique and pacing, conducting technique and interpretive gesture, choral diction, score analysis and preparation, performance practices, and the affective/effective conductor will be applied to individual student performance at the podium.

MUED 606. Choral Literature and Style. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will provide the practicing choral musician with a survey of choral repertoire through the ages, highlighting various genres within each historical period. Emphasis will be placed on stylistic considerations and performance practices. Students will be engaged in determining the standards which define quality choral repertoire.

MUED 608. Teaching the Adolescent Singer. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In this course students will study psychological, behavioral and developmental aspects of the young singer. An in-depth look at the characteristics of the changing male and female voice will include research and conclude with observations of adolescent voices. The class will also cover range, registration and choral repertoire appropriate for the various stages of the adolescent singer.

MUED 610. Psychology of Music. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an introduction of the psychological foundations of music behavior. Topics will include functions of music in human society and culture, psychoacoustics of musical sound, cognitive processes of music perception and the creation/recreation of music, affective response, music learning theories and measurement of musical ability and learning.

MUED 614. Instrumental Conducting Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students in this class will discuss literature, score study strategies, rehearsal techniques and ensemble motivation issues. Conducting technique and rehearsal technique will be developed by hands-on experiences with a workshop band, as well as through guided discussions and classroom sessions. The goal is personal musical growth and enhanced podium effectiveness for each participant.

MUED 616. Researching the Wind Band: Strategies and Resources. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This class is designed to enable students to gain greater access to information relative to all aspects of the wind band. Students will become familiar with a wide variety of sources including written materials, Web-based materials, recordings, video and organizations. There will also be assignments to acquaint students with methods used in the various facets of wind band research.

MUED 618. History and Literature of the Wind Band. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In this class students will study the historical development of wind bands and wind band repertoire. The result of this study will be to enable students to evaluate new repertoire by comparison to masterworks and to be able to place pieces into a historical continuum. Studying the history of wind bands is necessary to understand the current state of the profession and how wind bands fit into the broader spectrum of music history.

MUED 620. Introduction to Research in Music Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Development of fundamental skills necessary to understand and evaluate research in music education. Focuses on the basic principles, concepts and techniques of research methodology applied specifically to music education. Includes introduction to quantitative, qualitative, ethnographic and historical methodology.

MUED 676. School Music Supervision and Administration. 2 Hours.
Semester course; 2 lecture hours. 2 credits. The study of the organization, curriculum, course content, administration, and personnel problems in public school music.

MUED 783. Final Project in Music Education. 1 Hour.
Semester course; 1 laboratory hour. 1 credit. May be repeated for a total of 5 credits. The final project is an intensive experience in identifying and developing a topic of interest and value to the student and the profession, and the final presentation of that topic. This course is part of the culminating process for the music education track in the Master of Music program. As an individualized project/course, the faculty chair provides initial approval and gauges progress toward completion of the final project. It is the responsibility of the student to maintain consistent communication with their chair throughout the semester to ensure adequate progress is being made. Completion is determined by the final approval of the faculty chair and committee (if applicable). Completion of the final project is not determined by total number of credits earned in the course. Graded as S/U/F.

MUED 799. Thesis. 1-3 Hours.
Semester course; 1-3 credits. May be repeated. Prerequisite: Permission of the music education coordinator. Preparation of a thesis based on independent research.

Music History, Literature and Theory (MHIS)

MHIS 591. Topics in Music. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 9 credits. Flexible term courses in selected aspects of music performance, theory, literature, or history. See the Schedule of Classes for specific topics to be offered each semester.

MHIS 592. Individual Project. 1-6 Hours.
Semester courses; 1-6 credits. Prerequisites: permission of supervising faculty member, adviser and department chair. Open only to degree-seeking graduate students in music. Individual work in an area not otherwise available to the student.

Painting and Printmaking (PAPR)

PAPR 525. Issues in Contemporary Visual Arts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 6 credits. Prerequisite: Painting and printmaking majors only. The investigation of content and meaning of major directions in contemporary art as they relate to the studio. Students will relate their own work to major movements in contemporary visual art.

PAPR 527. Art and Critical Theory. 3 Hours.
Semester courses; 3 lecture hours. 3, 3 credits. Prerequisite: General art history or equivalent. Major themes in art criticism and theory from 1940 to the present. This course provides an introduction to the literature of art criticism as well as artists' writings in relation to studio production.

PAPR 528. Art and Critical Theory. 3 Hours.
Semester courses; 3 lecture hours. 3, 3 credits. Prerequisite: General art history or equivalent. Major themes in art criticism and theory from 1940 to the present. This course provides an introduction to the literature of art criticism as well as artists' writings in relation to studio production.

PAPR 591. Topics in Painting and Printmaking. 1-4 Hours.
Semester course; 1-4 credits. May be repeated for a maximum of 9 credits with different content. This course will explore selected topics of current interests or needs relative to painting and printmaking. See the Schedule of Classes for specific topics to be offered each semester.

PAPR 605. Graduate Painting. 3,6 Hours.
Semester course; 6 or 12 studio hours. 3 or 6 credits. May be repeated. A studio class in which primary emphasis is placed on the creative disciplines of contemporary painting. Special attention is given to the development of personal expression through individual criticism.

PAPR 615. Graduate Printmaking. 3,6 Hours.
Semester courses; 6 or 12 studio hours. 3 or 6 credits. May be repeated. Specialization in one printmaking medium with emphasis upon technical research and the aesthetic suitability of design to medium.

PAPR 621. Graduate Drawing. 3 Hours.
Semester course; 6 studio hours. 3 credits. May be repeated. A studio class with individual criticism. Special attention is given to contemporary concepts. Permission of instructor required for non-painting and printmaking majors.

PAPR 690. Graduate Seminar. 1-3 Hours.
Semester course; 1 or 3 lecture hours. 1 or 3 credits. May be repeated. Degree requirement for graduate students in the Department of Painting and Printmaking. Weekly seminar for the purpose of discussion of recent artistic developments in painting and printmaking. Critiques dealing with student work will take place.

Photography and Film (PHTO)

PHTO 500. Photographic Studio and Seminar. 3 Hours.
Semester course; 1 lecture and 6 studio hours. 3 credits. Prerequisite: Permission of instructor. A seminar that examines the technical and aesthetic components of photography and filmmaking processes and the language and theories of photography and film criticism.

PHTO 601. Photographic Studio. 3,6 Hours.
Semester course; 6 or 12 studio hours. 3 or 6 credits. May be repeated. Prerequisite: Nonmajors may enroll with permission of instructor. Student will work on specific problems relating to the areas of their major interests. Options will be available in black and white photography, color photography, and motion picture photography.

PHTO 621. Research in Photography and Film. 3,6 Hours.
Semester course; 6 or 12 studio hours. 3 or 6 credits. May be repeated. Prerequisite: Nonmajors may enroll with permission of instructor. Students will engage in appropriate theoretical, experimental, or historical research in a specific area.

PHTO 690. Seminar in Photography and Film. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated. An examination of contemporary issues and developments in photography and film. Students will have a chance to discuss their work and the work of others.

PHTO 692. Independent Study in Photography and Film. 1-3 Hours.
Semester course; variable lecture hours. 1 to 3 credits. May be repeated for a maximum of six credits. Individual instruction and supervision of a special project. Learning experiences should be designed with the supervising faculty member in the form of a contract between student and instructor.

PHTO 693. Fieldwork, Internship. 3,6 Hours.
Semester course; 6 or 12 studio hours. 3 or 6 credits. May be repeated. Professional field experience in the theoretical and practical applications of photography and/or film through cooperative organizations. Formal arrangements will be made with state agencies, industries, community organizations, and professionals in the field.

PHTO 699. Graduate Exhibition. 1,3 Hour.
Semester course; 1 or 3 lecture hours. 1 or 3 credits. May be repeated. To be taken after M.F.A. candidacy with the approval of the graduate director and department chair and review of the student's record. Students prepare and execute a public exhibit of their creative work and provide complete documentation of the sources and ideas presented.

Sculpture and Extended Media (SCPT)

SCPT 500. Graduate Sculpture. 2-6 Hours.
Semester course; 4, 8 or 12 studio hours. 2, 4 or 6 credits. May be repeated for a maximum of 20 credits. Emphasis on individual creative production with periodic exposure of student's work and ideas to the critical attention of the teaching faculty of the department of sculpture and other graduate students.

SCPT 517. Seminar in Contemporary Sculpture. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 12 credits. A forum for consideration and discussion of recent developments in the field.

SCPT 591. Topics in Sculpture. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be repeated for a maximum of 12 credits. This course will explore selected topics of current interests or needs relative to sculpture. See the Schedule of Classes for specific topics to be offered each semester.

SCPT 600. Graduate Sculpture. 2-6 Hours.
Semester course; 4, 8 or 12 studio hours. 2, 4 or 6 credits. May be repeated for a maximum of 28 credits. Emphasis on individual creative production with periodic exposure of student's work and ideas to the critical attention of the teaching faculty of the department of sculpture and other graduate students.

SCPT 690. Graduate Seminar. 1,4 Hour.
Semester course; 4 lecture hours. 4 credits. May be repeated for a maximum of 16 credits. Degree requirement for graduate students in the department of sculpture. Weekly seminar for the purpose of exploring recent developments in sculpture and conducting critiques in which students can discuss the ideas and attitudes manifest in their work.

SCPT 692. Independent Study in Sculpture. 1-4 Hours.
Semester course; variable lecture hours. 1 to 4 credits. May be repeated for a maximum of 8 credits. This course will be limited to graduate students in sculpture in high standing within the program. Learning experiences will be designed with the supervising faculty member in the form of a contract between student and instructor.

Theatre (THEA)

THEA 501. Basic Voice and Speech Pedagogy. 3 Hours.
Semester course; 3 credits. Exploration of methodologies used in teaching basic principles of body alignment, breath support, resonance and dynamics of voice and speech. A review of IPA as it applies to American speech and dialect study.

THEA 502. Basic Voice and Speech Pedagogy With Application to Dialect Study. 3 Hours.
Semester course; 3 credits. Review of IPA. Study of six dialects while investigation a variety of teaching methodologies.

THEA 505. Advanced Scene Design III. 3 Hours.
Semester course; 1 lecture and 4 studio hours. 3 credits. Prerequisites: THEA 306 and permission of instructor. Intensive study of the professional standards and practices expected of scene designers.

THEA 506. Advanced Scene Design IV. 3 Hours.
Semester course; 1 lecture and 4 studio hours. 3 credits. Prerequisites: THEA 505 and permission of instructor. Continued intensive study of the professional standards and practices expected of scene designers.

THEA 508. Scene Painting. 3 Hours.
Semester course; 10 studio hours. 3 credits. May be repeated with permission of instructor for up to 12 credits. Study of the materials and techniques of scenic painting as well as the practices and expectations of those pursuing careers as scenic artists.

THEA 509. Theatre History and Historiography. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of modern theatre practice, dramatic literature and theory coupled with the study of applicable methodologies and historical writings as evidence in the development of performance and performance scholarship.

THEA 510. Theatre Historiography. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of how theatre history is documented and researched, and the theoretical perspectives that inform its writing.

THEA 513. Graduate Acting. 3 Hours.
Continuous courses; 6 studio hours. 3-3 credits. Graduate-level studio performance courses that utilize monologues and scenes as a venue to explore rotating topics in performance technique which may include Constantin Stanislavski, Michael Chekov, Uta Hagen, Sanford Meisner and Stella Adler.

THEA 514. Graduate Acting. 3 Hours.
Continuous courses; 6 studio hours. 3-3 credits. Graduate-level studio performance courses that utilize monologues and scenes as a venue to explore rotating topics in performance technique which may include Constantin Stanislavski, Michael Chekov, Uta Hagen, Sanford Meisner and Stella Adler.

THEA 517. Physical Acting. 3 Hours.
Semester course; may be repeated for a total of 12 credits. Prerequisite: Permission of instructor. Exploration and discovery of the principles of movement and their practical application to the stage. Emphasis on character development, solo and group scene work, physical comedy, and stage combat.

THEA 518. The Pedagogy of Movement. 3 Hours.
Semester course; 6 studio hours. 3 credits. Exploration of the principles of teaching movement and its practical application to the stage, with special emphasis on the links between physical theatre and the vocabulary of the Stanislavski system of acting.

THEA 593. Professional Internship. 3-9 Hours.
Semester course; 3-9 credits. May be repeated. Prerequisite: Permission of department chair. Majors only. A practicum in theatre conducted in cooperation with selected professional or semiprofessional theatre organizations.

THEA 600. Introduction to Performance Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Interdisciplinary and multicultural study of cultural, social and aesthetic structures of performance.

THEA 601. Advanced Voice and Speech Pedagogy: Shakespeare. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An exploration of a variety of methodologies used in teaching the speaking of Shakespeare's texts. Focus on scansion, rhetorical devices, full voicing and support of Shakespeare's language for the stage.

THEA 602. Advanced Topics in Voice and Speech Pedagogy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An exploration of a variety of specialty topics which may include but is not limited to vocal extremes, archetypes and the voice, voice in the out of doors.

THEA 603. Dramatic Literature and Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Multicultural study of selected plays in the history of dramatic literature, criticism and theory.

THEA 604. Modern Theatre: Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Seminar in the performance practices, texts and theories that have shaped the theatre throughout the 20th century.

THEA 605. Advanced Studies in Stage Design. 3 Hours.
Continuous courses; 1 lecture and 4 studio hours. 3-3 credits. Prerequisite: Permission of instructor. An advanced study in specific problems in stage design.

THEA 606. Advanced Studies in Stage Design. 3 Hours.
Continuous courses; 1 lecture and 4 studio hours. 3-3 credits. Prerequisite: Permission of instructor. An advanced study in specific problems in stage design.

THEA 607. Problems in Scenic Techniques. 3 Hours.
Continuous courses; 1 lecture and 4 studio hours. 3-3 credits. Prerequisite: Permission of instructor. An advanced, detailed study of selected problems in contemporary theory and practice of scenic techniques.

THEA 608. Problems in Scenic Techniques. 3 Hours.
Continuous courses; 1 lecture and 4 studio hours. 3-3 credits. Prerequisite: Permission of instructor. An advanced, detailed study of selected problems in contemporary theory and practice of scenic techniques.

THEA 609. Seminar in Production Process. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. May be repeated with different topics for a maximum of 9 credits. Students and faculty in design, technical theatre, and performance working together in studio situations to identify and solve problems relating to the planning, preparation, and realization of productions.

THEA 610. Proseminar in Text and Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of how theatre history is documented and researched, and the theoretical perspectives that inform its writing.

THEA 613. Advanced Problems in Acting. 3 Hours.
Semester course; 3 credits. May be repeated with permission of instructor. Focus on acting problems related to the actor's needs to develop proficiency in craft areas.

THEA 614. Pedagogy of Acting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course guides students through creating and implementing a curriculum appropriate for a beginning acting class. Discussions of acting theory and teaching practice are interspersed with teaching demonstrations complete with peer feedback and instructor critique.

THEA 617. Special Topics in Physical Acting. 3 Hours.
Semester course; 6 studio hours. 3 credits. Rotating topics in physical acting, which may include mask, mime, physical comedy, clowning and other approached to physical theatre.

THEA 618. Special Topics in Choreography and Directing. 3 Hours.
Semester course; 6 studio hours. 3 credits. Rotating topics in choreography and directing, which may include dance, stage combat, battle scenes, musicalized movement and other choreographic scenes.

THEA 619. Theatre Pedagogy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and practice in the teaching of college-level theatre.

THEA 621. Problems in Costume Design. 3 Hours.
Semester courses; 2 lecture and 2 studio hours. 3, 3 credits. May be repeated. Prerequisite: Permission of instructor. An advanced study in specific problems in costume design.

THEA 622. Problems in Costume Design. 3 Hours.
Semester courses; 2 lecture and 2 studio hours. 3, 3 credits. May be repeated. Prerequisite: Permission of instructor. An advanced study in specific problems in costume design.

THEA 623. Advanced Studies in Modern Drama. 3 Hours.
Semester course; 3 lecture hours. 3, 3 credits. Intensive, detailed studies of selected subjects in major 19th- and 20th-century drama.

THEA 624. Advanced Studies in Modern Drama. 3 Hours.
Semester course; 3 lecture hours. 3, 3 credits. Intensive, detailed studies of selected subjects in major 19th- and 20th-century drama.

THEA 630. Production. 3 Hours.
Semester course; 6 laboratory hours. 3 credits. May be repeated. The design, rehearsal, and performance of dramatic works.

THEA 640. Advanced Theatre Projects. 3,6 Hours.
Semester course; 1 or 2 lecture and 4 or 8 laboratory hours. 3 or 6 credits per semester. May be repeated. Individual or group projects in acting, directing, costume design, stage design or dramaturgy.

THEA 641. Advanced Theatre Projects. 3,6 Hours.
Semester course; 1 or 2 lecture and 4 or 8 laboratory hours. 3 or 6 credits per semester. May be repeated. Individual or group projects in acting, directing, costume design, stage design or dramaturgy.

THEA 651. Individual Study in Graduate Design. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisite: permission of instructor. May be repeated. Intensive individual training in design and presentation processes as they apply to contemporary professional production.

THEA 661. Graduate Direction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Graduate-level studio course designed to introduce students to concepts involved in play direction, including play analysis, composition, blocking, style and form. Exercises and projects will reinforce elements discussed in class and include opportunities for stage work complete with peer feedback and instructor critique.

THEA 662. Graduate Direction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Graduate-level studio course designed to introduce students to concepts involved in play direction, including play analysis, composition, blocking, style and form. Exercises and projects will reinforce elements discussed in class and include opportunities for stage work complete with peer feedback and instructor critique.

THEA 693. Colloquium and Practical Training. 3 Hours.
Semester course; 2 lecture and 2 studio hours. 3 credits. May be repeated for a maximum of 12 credits. Literary, historical, and theoretical studies together with specialized voice and movement training related to dramatic works in production.

THEA 694. Theatre Pedagogy Professional Internship. 1-6 Hours.
Semester course; 1 or 3 lecture hours. 1, 3 or 6 credits. May be repeated. Prerequisites: THEA 519 and permission of the graduate adviser in theatre. Research, design, and either implementation or thoroughly planned implementation of a curricular research and development project of relevance to a formal speech and/or theatre pedagogy program.

THEA 696. Dramaturgy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of the function of the dramaturge in the American theatre. Readings, research and practical exercises for production dramaturgy of classic and contemporary plays.

THEA 697. Research and Special Problems in Theatre. 1,3 Hour.
Semester course; 1 or 3 credits. May be repeated with permission of graduate adviser. Individually directed study and research under faculty supervision on approved research problems or projects in theatre.

THEA 698. Creative Project. 3 Hours.
Semester course; 3 credits. Provides the culminating performance or design experience in the student's degree emphasis. Adjudicated by the faculty.

THEA 699. Creative Project Evaluation. 3 Hours.
Semester course; 3 credits. Provides the student in acting, directing, costume design, and stage design the opportunity to document and evaluate the creative project. Defended before a committee of the faculty.

THEA 791. Seminar in Special Issues in Theatre. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 12 credits. Additional credits may be taken with permission of the graduate directory. Prerequisite: permission of instructor. An advanced, detailed study of selected contemporary issues not included in the regular curriculum. See the Schedule of Classes for specific topics to be offered each semester.

THEA 799. Thesis. 1-6 Hours.
Semester course; 1-6 credits. May be repeated. Prerequisite: Permission of the department graduate studies adviser and department chair. Preparation of a thesis based on independent research.

School of Business

Accounting (ACCT)

ACCT 507. Fundamentals of Accounting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theoretical and technical aspects for accumulating and reporting financial information for business. Emphasis on current financial accounting issues confronting businesses and interpretation of financial information reported by business. This is a graduate foundation course.

ACCT 604. Advanced Auditing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 406 with a minimum grade of C. Development of auditing theory, special disclosure issues, statistical sampling, and ethical, legal and social responsibilities of external and internal auditors. Emphasis on contemporary topics in auditing.

ACCT 608. Managerial Accounting Concepts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 507. The use of accounting information contained in reports to management. The functions of planning, decision making, and control are studied as accounting data are reported through the firm's information system and in special analyses.

ACCT 610. Forensic Accounting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 406 with a minimum grade of C. Study of forensic accounting topics, including fraudulent financial reporting, employee fraud, money laundering, litigation services, evidence management, computer forensics and business valuation.

ACCT 662. Advanced Topics in Accounting Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 307 with a minimum grade of C. Study of accounting systems, concepts and applications with reference to actual problems encountered in the analysis, design, implementation, use, audit and evaluation of accounting systems in a computer environment.

ACCT 680. Tax Research and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 301 with a minimum grade of C. Tax research methodology; the sources of tax law and their relationship to tax research.

ACCT 681. Tax Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 301 with a minimum grade of C. The Internal Revenue Service and the practices and procedures involved and/or available for the settlement of tax controversies and common elections of accounting methods.

ACCT 682. Corporate Taxation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ACCT 301 with a minimum grade of C. Corporate tax laws as related to the corporations involved and to individual shareholders; tax aspects of the creation, operation, reorganization, and partial liquidation of corporations; corporate distributions.

ACCT 697. Guided Study in Accounting. 1 Hour.
Semester course; 1 lecture hours. 1 credit. Prerequisite: Approval of proposed work is required by Graduate Studies office in the School of Business. This course is restricted to accounting majors. The primary purpose of this course is to allow international students to take advantage of an internship work experience. This course may also be used by accounting graduate students to do research on problems in accounting. Students will be assigned reading and will prepare a written report. Graded as pass/fail.

ACCT 790. Research Methods Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Analyzes and critiques general theories, practices and functions in a specialized area of accounting research.

ACCT 791. Managerial Accounting Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Presents contemporary issues in managerial accounting and auditing research.

ACCT 792. Financial Accounting Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Presents and analyzes contemporary issues in financial accounting.

ACCT 793. International Accounting Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Presents contemporary issues and research in international accounting.

ACCT 794. Behavioral Research Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Provides knowledge and skills for advanced accounting research.

ACCT 795. Auditing Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Presents contemporary issues in auditing research.

ACCT 797. Guided Study in Accounting. 6 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

ACCT 898. Dissertation Research. 1-12 Hours.
Semester course; variable hours.1-12 credits. Enrollment restricted to Ph.D. in Business students.

Brandcenter (BRND)

BRND 608. Accounting for Communication Professionals. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students. Course goal is to equip nonfinancial advertising students with the basic concepts of accounting and to apply their understanding of these principles to specific managerial situations within the advertising agency, brand management and marketing department environments. Students will also develop a framework for analyzing media results, ROI and various market/brand plan outcomes.

BRND 620. Brand Design for Brand Managers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Building student understanding of the role of design in its various forms within the marketing mix. Focused on design theory and covers all aspects of design and platforms and how consumers perceive brand essence.

BRND 621. Strategy and Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Building students' understanding of the role of strategists and experience designers working as a team.

BRND 622. Visual Storytelling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The goal of this class is to take a story and translate it successfully to the screen. Class will include lectures and technology sessions. Classes will be be divided between discussions about existing films and spots, and classes devoted to learning the use of lights, cameras and software editing. Three short films will be produced.

BRND 623. Physical Computing I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Conceptualizing projects with brands in mind and creating prototypes and making sure the final output fits the brand it is paired with. This class will yield actual working prototypes that can help get across the function and look to a design/engineering team to create a production model.

BRND 624. Physical Computing II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BRND 623. Restricted to Brandcenter students only. Dives deeper and builds off the content learned in the prerequisite course.

BRND 625. Comms Planning and UX. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. This class will instruct students on traditional tools such as Simmons, add in new media channel tools such as Sysomos and give students a foundation on the skill set of comms planning and the incorporation of UX attributes into their strategic work.

BRND 627. Visual Storytelling and Design for Strategists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. The goal of this class is to take a story and translate it successfully to the screen. Class is geared to strategy students. Basic production techniques will be taught. By the end of the semester, students will be able to write, produce, shoot and edit a variety of commercial and viral video pieces. Short films will be produced. In order to bring this visual sensibility to all their work, strategists will be taught key design software that will enable them to improve the communication value of their written and presentation work.

BRND 629. Strategic Thinking. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Contrasting historically rigid ways of approaching problems to newer, more dynamic approaches will prepare students to professionally engage a constantly shifting world of business, consumer, political and economic forces. Students will engage in semester-long projects to develop new ways of thinking strategically, including writing a strategic plan and scenario plans (the art of looking ahead and envisioning various realities for a company). Students will work directly with local small business owners in developing and formally presenting relevant strategies.

BRND 630. Problem Solving for Art Directors. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to Brandcenter students only. Explores the media of print, Internet and television to develop and understand the basis of good design and art direction. Will work through the process of visual concepts and execution.

BRND 631. Craft. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. Explores the delivery of concepts to an audience to determine how the message is received. Will teach how to attack a problem, how to work through a creative block and how to be a better judge of your own work.

BRND 633. User Participation Platforms. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Harness the power of Web users by designing within the architecture of user participation. Branding is no longer a one-way communication model. This course focuses on understanding and managing the communications from consumers to other consumers via the Web. Students will learn to cultivate organic growth and orchestrate grassroots efforts, as well as explore considerations in physical computing and augmentation of technology within someone's reality.

BRND 635. Creating Gravitational Pull. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Driving traffic to websites. Includes search engine optimization and search engine marketing, but goes way beyond. Designing integrated brand campaigns linking different channels and media types to take consumers on a journey with different touch points, channels and devices. Students will use proven strategies and design campaigns to have a live website and pull visitors to it. Students are expected to demonstrate their abilities on live sites where the effectiveness of their efforts is realized in real-time results.

BRND 638. Brand Engagement. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. Enhancing consumers' brand experience. Students explore interactive ways to engage consumers. Core aspects of the future of the Web are explored. Students will be familiar with current engagement techniques, and they will create new ways to connect with consumers. Emphasis on the creation of ideas of sufficient scope as to become the basis for ad campaigns covering many platforms, especially including the Web.

BRND 639. Cultural Impact: Advanced Account Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. Identify a cultural issue that can impact business results and formulate a hypothesis for investigating the issue. Students gain experience in identifying a research need, in developing a research plan and methodology and in fielding the plan. After research, students get experience determining what they have learned and knowing what it means to the client.

BRND 640. Problem Solving. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. Focuses on developing ability to create well-written, creatively focused advertising copy that solves communications problems. Addresses headline and body copy issues through presentation of students' work and research on major copywriters and their work.

BRND 648. Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. This course will challenge students to learn the techniques of innovators in business and the community. The course combines lectures and instruction with a semester-long innovation competition in partnership with global brands. Both invention and execution will be explored.

BRND 649. Brand Analytics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Learning and applying statistical methodologies for analytics in order to make smart decisions for effective brand management. Techniques for decision-making are explored along with Web analytics, performance metrics and ROI.

BRND 651. Creative Thinking. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to Brandcenter students only. Focuses on developing the creative skills necessary for solving advertising communication problems. Enables students to maximize and strengthen creative abilities through lecture, brainstorming sessions, and team-oriented strategy sessions focusing on real case projects.

BRND 652. Concept Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BRND 651. Develops students' ability to create visually effective work that targets specific groups of consumers through ongoing review and discussion sessions designed to pinpoint strategies and create relevant visually oriented ideas quickly. Emphasizes a teamwork approach to art direction and concept development.

BRND 653. Portfolio Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BRND 652. Focuses student toward creative solutions to communication problems. Addresses specific strategies including briefs and concept work that require extensive copy. Emphasizes a team approach to copywriting and art direction.

BRND 659. Brand Experiences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Provides thorough coverage for designing comprehensive brand communications for real-world clients that involve physical experiences for consumers. Projects will force students to think about every aspect of the consumer experience including store appearance, product selection, employee behavior and the purchasing process. An emphasis will be placed on producing comprehensive campaigns that develop strategic and creative brand experiences for customers.

BRND 662. Research Methodologies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. Review a variety of qualitative and quantitative research techniques as well as an introduction to writing creative briefs. Students will learn how to translate research into insightful creative and business platforms. This is a practical course that prepares students to be senior-level strategic thinkers throughout their careers.

BRND 664. Persuasion. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only or by permission of instructor. This course offers an intensive in skills necessary to persuade when presenting work and ideas. Topics such as voice delivery, personal style, effective presentation of creative work, storytelling and capturing audience attention will be covered. Student presentations will be critiqued and videotaped for analysis.

BRND 667. Applied Brand Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Exposes students to detailed, practical information about the tools and tactics used to apply inventive brand strategies. Students will be exposed to managerial functions involving marketing and project management, while being challenged to synthesize and simplify complex information in order to create actionable plans. A portion of the course is dedicated to the use of a simulation case, "Pharmasim," which allows students to test theories and get real-time feedback on the likely results of their decisions.

BRND 668. Advanced Brand Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Involves intensive, interactive exploration of factors that affect the success of brands. Students study brand delivery systems from product and packaging design through sales channels to the ultimate consumer. The curriculum combines individual casework and team assignments to ground students in the art and science of strategy development. Students are also exposed to guest lecturers with brand management and integrated marketing expertise. Since brand managers must direct and manage the efforts of colleagues and agencies not under their control, there is a concentration on developing forceful, persuasive communication skills.

BRND 670. Creative Fusion. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to Brandcenter students only. Integrating new branding methods with traditional approaches (like advertising, public relations and direct marketing) to develop powerful, coordinated and synergistic campaigns.

BRND 673. Experimentation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Creative tracks working together in teams to create shifts in established paradigm and executing a prototype of these solutions.

BRND 677. The Business of Branding. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Requires students to develop ideas ranging from strategic to tactical and from rational to emotional. Students will be called on to develop and examine ideas that differentiate brands, build sales and affect market share. The new business process will be considered and successful presentation techniques will be evaluated. Ethical considerations faced by industry practitioners will be explored.

BRND 695. Internship: Brandcenter. 1 Hour.
Semester course; 1 credit. Restricted to Brandcenter students only. Selected students will receive on-the-job training under the supervision of the instructor and employer. Internships are available in a variety of branding opportunities.

BRND 696. Advanced Portfolio. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to Brandcenter students only. Continues the development and demonstration of conceptual and creative abilities and insights in a variety of areas sought by agency art directors, copywriters and recruiters. Individual development of concepts and materials necessary for the creation of mini-books and portfolios under one-on-one instruction. Independent projects pursued specifically for individual portfolio development.

Business (BUSN)

BUSN 601. Studies in Contemporary Business Issues: ____. 1 Hour.
Semester course; 1 lecture hour; content delivered online. 1 credit. May be repeated for a maximum of six credits. Enrollment restricted to students in the online MBA program. Course provides advanced study and analysis of contemporary business issues.

BUSN 610. On-campus Residency. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for a maximum of three credits. Enrollment restricted to students in the online MBA program. MBA faculty will lead this two-day residency immersion session offering activities such as seminars, case and/or simulation assignments, and meetings with business and thought leaders to enhance team-building, leadership and professional development skills. Students will be evaluated on face-to-face presentation skills, group interaction and career development plans. Graded as pass/fail.

BUSN 700. Principles of Scientific Inquiry in Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A seminar on the philosophical and epistemological foundations of scientific inquiry as they relate to research in business and its allied disciplines. The focus will be on the underlying logic, elements, reach and limits of alternative frameworks, such as positivism, empiricism and Bayesean analysis, and the conditions under which each is the preferred method of inquiry.

BUSN 701. Research Methods in Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: admission to Ph.D. program and permission of instructor. A seminar on the design of research in business, including the philosophy of science, theory development and the design of research capable of testing hypotheses, analytic levels, measurement theory and methods, and research design alternatives.

BUSN 702. Research Analysis in Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 524 or equivalent and acceptance into the doctoral program. Study of the scientific method as currently applied in business and organizational research, with emphasis on the conduct of studies, data analysis and presentation of empirically based knowledge.

Computer and Information Systems Security (CISS)

CISS 609. Advanced Computational Intelligence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: an undergraduate course in artificial intelligence, or equivalent background with permission of instructor. Exploration of issues related to application of computational intelligence techniques to system security, particularly in the detection of anomalous system behavior. Of particular interest are issues associated with the automated detection of anomalies caused by authorized users through intended malicious behavior or through accidental misuse, and issues associated with automated user authentication. Crosslisted as: CMSC 609.

CISS 616. Data Warehousing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 610. Covers important concepts and techniques in the design and implementation of a data warehouse. Topics include the data warehouse architecture, the logical and physical design issues in the data warehousing development process, technical factors (i.e., hardware, client/server technology, data warehousing and DBMS technologies) and implementation considerations (i.e., data extraction, clean-up and transformation tools). Introduces online analytical processing and data mining. Crosslisted as: INFO 616.

CISS 618. Database and Application Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theory and practice of database and software security focusing in particular on some common database software security risks and on the identification of potential threats and vulnerabilities. Crosslisted as: CMSC 618.

CISS 622. Network and Operating Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CISS 624. Studies the principles of network security and secure operating systems. Included are topics relating to the use of intrusion detection, intrusion prevention and other related tools. Crosslisted as: CMSC 622.

CISS 624. Applied Cryptography. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a comprehensive survey of modern cryptography. Included are techniques of enciphering and deciphering messages using cryptographic algorithms, block ciphers and block cipher modes, hash functions and message authentication codes, public key cryptography and digital signatures, and steganography. Crosslisted as: CMSC 620.

CISS 634. Ethical, Social and Legal Issues in Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyzing socio-political and ethical issues surrounding computer and information systems security. Topics include privacy laws, identity theft, information collection and retention policies, and enforcement.

CISS 644. Principles of Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or INFO 661. Explores issues related to protecting information resources of a firm. Various tools and techniques useful for assessing CISS security concerns in organizations are introduced. Principles and models for CISS security and security management are presented and selected computer and CISS security topics are introduced. Material is presented and discussed from a management frame of reference. Crosslisted as: INFO 644.

CISS 646. Computer and Information Systems Access Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Detailed discussion of access control, including administration, identification and authentication techniques, methodologies and implementations, methods of attack, monitoring, and penetration testing.

CISS 654. Business Continuity and Disaster Recovery Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Fundamentals of business continuity and disaster recovery planning. Includes risk assessment, physical facility protection, data recovery planning, strategies for network backup, desktop recovery, emergency decision making, and maintenance and testing of the plan and its components.

CISS 693. Practice of Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will undertake practical research projects. Written reports of the investigations are required. This course is intended to be taken at the end of the program.

CISS 697. Guided Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Intended for graduate students in the Computer and Information Systems Security program wishing to do research on problems in computer and information systems security. Approval of proposed work is required by the director of graduate programs of the Department of Information Systems or of the Department of Computer Science no later than the 10th week of the prior semester. Each student will work with an appropriate faculty member on an approved research proposal. The student will submit a written report on the research conducted as the final product for the course. This course is intended to be taken near the end of the student's degree program.

Decision Analytics (DAPT)

DAPT 611. Analysis and Design of Database Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on relational databases for structured data and includes entity relational diagram and extended entity relational diagram and transformation of ERD and EERD into relational schema. The course will give students competence in SQL and other search techniques, data validation and data cleansing.

DAPT 612. Text Mining and Unstructured Data. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Focuses on unstructured data and includes the topics: creation of XML documents, creating/validating ontology; identifying terms and their relationships and converting them into an ontology using an ontology editor such as Protégé; object-oriented programs; extracting keywords and key phrases; term similarity measure and term frequency.

DAPT 613. Tools for Business Intelligence. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides students with techniques and practices for modern decision-making in support of business/corporate performance. Includes hands-on experience with various information analysis, business intelligence and decision-support techniques and tools with applications to various business-problem scenarios, such as portfolio analysis, project selection, market research and supply-chain optimization.

DAPT 614. Advanced SQL. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: DAPT 611. This course is designed to prepare students for multiple table queries using structured query language and will provide advanced training in the application of SQL to real data problems.

DAPT 615. Emerging Technologies. 1 Hour.
Semester course; 1 lecture hour.1 credit. The course emphasizes the study of a variety of big data technologies to gain insight that will be used to get people throughout the enterprise to run the business more effectively and to provide better service to customers. The course focuses on big data solutions that are processed in a platform that can handle the variety, velocity and volume of data by using a family of components that require integration and data governance.

DAPT 621. Statistics for the World of Big Data. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers single variable and multivariable statistical techniques using commercial computer packages such as SAS and SPSS. Students will learn when different techniques are warranted, conceptually how techniques function, how to perform the analysis using commercial computer packages and how to interpret the program outputs.

DAPT 622. Statistics for the World of Big Data II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: DAPT 621. Continues an emphasis on data visualization and statistical modeling for different types of variables, including relationships between multivariable variables.

DAPT 631. Data Mining. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Data mining is the extraction of implicit, previously unknown and potentially useful information from data. Data mining tasks include classification and regression (pattern recognition), cluster analysis, association analysis, and anomaly detection. This class will introduce methods for each of these tasks, their implementation in relevant software and the interpretation of data mining results.

DAPT 632. Forecasting Methods and Applications for Managerial Decision-making. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Methods covered include moving average and exponential smoothing, seasonal adjustments, time-series, and forecast averaging. Particular emphasis on developing and implementing forecasting systems in an interactive organization and appreciation of issues and caveats.

DAPT 633. Introduction to Marketing and Customer Analytics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Examines how firms make use of analytic tools to target advertising, improve customer response and service, and improve financial performance. The course will apply quantitative tools students have already seen (statistical analysis, simulation and regression analysis) to marketing and customer-response decisions.

DAPT 641. Introduction to Simulation Methods. 1 Hour.
Semester course; 1 lecture hour. 1 credit. An introduction to the application and theoretical background of simulation. Topics include Monte Carlo simulation and modeling systems using discrete event simulation. Theoretical topics include random variable generation, model verification and validation, statistical analysis of output, and decision-making via simulation. A high-level simulation language will be utilized.

DAPT 642. Introduction to Risk Analysis. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presents a formal methodology for prescriptive decision-making under risk and uncertainty. Decision analysis applies to hard problems involving sequential decisions, major uncertainties, significant outcomes and complex values. The course includes building and solving influence diagrams and decision trees; modeling uncertainty with subjective probabilities; the value of information; and modeling risk preferences with utility functions. Decision and risk analysis applications in business and government are considered.

DAPT 643. Introduction to Optimization Models. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Mathematical optimization is used to support quantitative and logical decision-making by providing a prescription of choices that minimize cost or maximize profit. This class provides an introduction to using optimization tools to model, solve and interpret results of real-world decision problems. Examples of applications include loan allocation, workforce scheduling, multi-period financial models and portfolio optimization.

DAPT 651. Personal, Interpersonal and Organizational Awareness. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This is an application-based course involving the understanding and application of communicating information in the personal, interpersonal/team and organizational setting. The focus is on barriers to communication, personal and audience awareness, listening skills, nonverbal communication behaviors, team-building and meetings management. A variety of practica and simulations will be used during this course.

DAPT 652. Professional Presentations: Strategy, Delivery and Technology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This is an application-based course involving the audience-centered design and application of effective oral presentations. The focus will be on the development and enhancement of public presentation skills in different types of formal and informal public situations. Further ability in appropriate presentation technology will be provided and assessment will be behavior-driven. A variety of practica and simulations will be used during this course.

DAPT 653. Written Communications: Strategy, Structure and Connection. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This is an application-based course involving the audience-centered design and application of effective written communications. The focus will be on the development and enhancement of writing and English skills for different types of organization-required documents, including email, proposals, executive summaries, letters and formal reports. Further assessment in grammar and syntax will be provided through online and faculty feedback. A variety of practicum and simulations will be used during this course.

DAPT 654. Written Communications: Strategy, Structure and Connection II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Continues topics and lessons from DAPT 653.

DAPT 661. Issues and Analytics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for a total of three credits. Academic, business, government and NGO leaders discuss current issues and applications of analytics. Analytics is a dynamically changing and evolving field. Students will have an opportunity to discuss current issues directly with people on the front lines.

DAPT 670. Analytics Problem Formation. 1 Hour.
Semester course; 1 lecture hour. 1 credit. An introduction to problem formulation and the decision-making process that must precede the application of analytics. Topics include objectives generation, structuring objectives, decision diagrams for risk and uncertainty modeling, and qualitative approaches to decisions under risk and value tradeoffs.

DAPT 681. Analytics Practicum I. 1 Hour.
Sponsored project. 1 credit. This course will allow students to apply the concepts, theories and skills learned in other courses to a real analytics project from a sponsoring organization. Teams of students will formulate a problem based on discussions with management of the sponsoring organization; query the sponsor's and/or public databases for appropriate data; perform required statistical analysis; and present results in both a written report and oral presentation to sponsoring management.

DAPT 682. Analytics Practicum II. 2 Hours.
Semester course; sponsored project. 2 credits. Continues project from DAPT 682.

DAPT 691. Topics in Decision Analytics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Study of current topics in decision analytics. Topics may vary from semester to semester.

Economics (ECON)

ECON 500. Concepts in Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Essential economic concepts including the price system, price determination in imperfectly competitive markets, employment theory, and monetary theory. This is a foundation course. Not open to students who have completed undergraduate foundation sequence: ECON 203 with a minimum grade of B and ECON 211, or ECON 210 and 211.

ECON 501. Introduction to Econometrics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 500, 210 or 203, the latter with a minimum grade of B; and MGMT 301, STAT 210 or STAT 212. Sources and uses of economic data; includes the application of statistical methods and regression analysis to time series and cross-section data to test hypotheses of micro- and macroeconomics.

ECON 600. Fundamental Economic Analyses of Business Decisions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide the non-business major with knowledge of fundamental economic principles and their application to business decisions and organization. Topics include supply of demand, elasticity, price determination by a firm with market power, optimal levels of employment, incentives and compensation, and multidivisional organization.

ECON 604. Advanced Microeconomic Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 614. Theory of prices and markets; value and distribution. Partial and general equilibrium analysis.

ECON 607. Advanced Macroeconomic Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 614. National income analysis, monetary and fiscal theory and policy, and general equilibrium analysis.

ECON 609. Advanced International Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211; or ECON 210 and ECON 211. An advanced-level examination of why trade occurs, balance of payments concept and adjustment, international equilibrium, forward exchange, markets, international investment, and international organizations.

ECON 610. Managerial Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211; or ECON 210 and ECON 211. M.B.A. students must take in conjunction with MGMT 641 or by permission of assistant dean of master's programs. Analysis of business decisions, applying tools of economic theory. Decisions on demand, production, cost, prices, profits and investments.

ECON 612. Econometrics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 501. Provides empirical content to the theoretical concepts of the economics by formulating and estimating models. Introduction to simultaneous equation problems in economics and the studies of production, demand, and consumption functions.

ECON 614. Mathematical Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211; or ECON 210 and ECON 211. Economic analysis utilizing simple mathematical methods. Includes derivation and exposition of theories and the application of tools to widen the scope and increase the usefulness of economics.

ECON 616. Advanced Public Finance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211; or ECON 210 and ECON 211. Theory and application of public finance, including taxation, expenditures, and budgeting. Special attention to cost-benefit analysis and to intergovernmental relations in federal system.

ECON 617. Financial Markets. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 501, MGMT 524, STAT 541, or MGMT 302; and ECON 500 or FIRE 520. Theories of markets for loanable funds are related to empirical findings and institutional structures. Yields of financial assets, kinds of debt instruments, financial institutions, public policy, financial models, and the role of money and credit in economic growth are considered.

ECON 620. The Economics of Industry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 301, ECON 303 or ECON 610. The application of economic analysis to the structure, conduct, and performance of industry; public regulation and policies to promote workable competition.

ECON 621. Topics in Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 500; or ECON 203 with a minimum grade of B and ECON 210; or ECON 210 and 211. Study of specialized topic(s) in economics.

ECON 623. Anomalies in Financial Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 617 and ECON 401. Considers anomalies, or evidence that is inconsistent with or difficult to explain using received theory in economics. Studying anomalies is useful both to develop a better, subtler understanding of received theory and to recognize how the theory may be refined or changed to resolve the anomalies. Anomalies considered include the equity premium puzzle, excess-volatility, over-reaction and under-reaction of asset prices, and asset allocation puzzles. In some cases a proposed anomaly can be explained by more careful treatment of the problem. In other cases, new theories (e.g., noise-trader models) are put forward to explain anomalies.

ECON 624. Health Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum grade of B and ECON 211. Develops an understanding of (1) economics as a managerial tool in making choices or decisions that will provide for an optimum allocation of limited health care resources and (2) economics as a way of thinking about and approaching issues of public policy in financing and organizing health and medical services. Individual research on crucial or controversial issues in the health care field. Crosslisted as: HADM 624.

ECON 631. Labor Market Theory and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211. Theoretical and empirical analysis of labor markets from both an economics and a management or human resource perspective. Topics will include employment concerns, wage structure and compensation packages.

ECON 641. Econometric Time-series Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 501 and ECON 614. Provides the analytical and programming tools needed to adeptly handle the statistical analyses of econometric time-series data. Topics include: stationarity, unit-roots, univariate time-series models, vector autoregressions and co-integration. These tools will be used to analyze movements in interest rates, exchange rates and equity markets as well as the transmission of monetary policy actions.

ECON 642. Panel and Nonlinear Methods in Econometrics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 612. Includes panel data analysis (fixed and random effects); identification and estimation of nonlinear models, limited dependent variable models (probit, logit, tobit, etc.), duration models; and hypothesis/specification tests. The techniques discussed in class will be used to analyze a variety of empirical questions. The course has an applications rather than a theoretical focus.

ECON 682. An Economic Approach to Environmental Issues. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 203 with a minimum B grade and ECON 211. The effect of externalities in terms of efficiency and equity considerations. The role and problems of benefit-cost analysis in decision making is developed. The interrelationship of air, water, and land quality issues is analyzed. The use rate of natural resources, energy consumption, and the steady-state economy and their impacts are evaluated.

ECON 691. Topics in Economics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1, 2 or 3 credits. Study of current topics. Topics may vary from semester to semester.

ECON 693. Field Project in Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a practical research project. A written report of the investigations is required. To be taken at the end of the program.

ECON 697. Guided Study in Economics. 1-3 Hours.
Semester course; 3 lecture hours. 1, 2 or 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students wishing to do research on problems in business administration or business education will submit a detailed outline of their problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

ECON 798. Thesis in Economics. 3 Hours.
Year course; 6 credits. Prerequisite: approval of the proposed work is required by the graduate adviser and the proposed thesis adviser. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

ECON 799. Thesis in Economics. 3 Hours.
Year course; 6 credits. Prerequisite: approval of the proposed work is required by the graduate adviser and the proposed thesis adviser. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

Fast Track Information Systems (ISTM)

ISTM 671. Organizational Culture and Team Building. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students an understanding of the impact information technology has made in defining an organization's culture and the processes that are used to support operational and strategic decision making. Groupware tools are used to simulate how organizations use computer-based collaboration software for sharing information, ideas and knowledge designed for improved productivity and decision making in order to enhance the organization's competitiveness strategically. Topics include: organizational culture and team building in the age of new business models, virtual work environments, privacy, telecommuting, monitoring Internet access and content, and communication etiquette, electronic teleconferencing, video, data and web conferencing.

ISTM 672. Information Systems Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the information requirements of an organization. The difference in the kinds of information needed at operational, administrative, strategic and organizational levels are emphasized. Planning and implementing a comprehensive information system and methods to measure its effectiveness are discussed. Topics include Capability Maturity Models, managerial support systems and information resources planning.

ISTM 673. Analysis and Decisions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the analysis and decisions required for selecting new systems or technology. Specifically, the course covers business requirements analysis, system life-cycle models, Unified Process and other system development methodologies, structural and behavioral system models, CASE tools, decision analysis for vendor and technology selection, feasibility and risk analysis, and implementation and transition management.

ISTM 674. Emerging Technologies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to identify emerging computer hardware, software and communication/network technologies that impact the design and implementation of new information systems. Topics will address emerging technologies that are changing data storage, modes of information processing and media for dissemination. Managerial challenges and issues, including new and existing technology compatibility, the return on new technology investments, and strategies for assessing and mitigating an organization's risk exposure are examined.

ISTM 675. IS Planning and Project Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a basic framework for understanding IT project management, building on the skills needed to manage projects of all sizes. Topics include the project life cycle, project team, project selection, project organization, project planning, negotiation and conflict resolution, and resource management. The responsibility and authority of a program manager and the integration of program functions in a complex organizational structure will be addressed. Through a combination of simulation activities with formal presentations and experiential learning, the following concepts will be addressed: definition of budgets, allocation of resources, consideration of ROI, earned value, management consideration of metrics accumulation and assessment, and control of scope creep.

ISTM 676. Information Systems Assurance and Security Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a fresh look at managing and protecting the information resources of a firm. While identifying issues, concerns and problems, the course takes students through various tools and techniques that are useful in interpreting information systems security concerns in organizations. In a final synthesis, principles and models are presented that help in proactively managing IS security.

ISTM 677. Structuring Information for Decision Making. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Presents an overview of information systems methods that are used to structure information for decision making. Following a review of the basics of data management, the course examines various database management systems. The course then continues with an investigation of data warehousing, data mining, XML, knowledge management and business intelligence. Students successfully completing the course will understand the range of potential data management options used to present information for decision making and their various strengths and weaknesses.

ISTM 678. IS in the Digital Economy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Expounds on the innovative nature of the confluence of the Web and business. The notion of disruptive technologies is introduced and discussed. Further, the means by which the relative success and failure of IS in the digital economy can be assessed/measured are deliberated. A number of emergent issues related to the digital economy (viz. eTrust, eCRM, social responsibility, etc.) are discussed.

ISTM 679. Enterprise Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Over the past decade, organizations have been relying more and more on enterprise-wide deployment of software applications (ERP) to solve their integration problems. This course begins by describing the true size and magnitude of the enterprise integration challenge, then it examines the general form of problem solution offered by these ERP packages. Since implementation of ERPs continues to be a major challenge, the course fully examines both the track record and successful approaches to enterprise information systems implementation. Finally, new developments in this area are explored.

ISTM 691. Topics in IT Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of current topics. Topics may vary from semester to semester.

Fast Track MBA (FMBA)

FMBA 601. Team Building and Leadership. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations steer members toward what needs doing. Design, functions and creation of teams, engaging leadership and motivation processes to set and achieve organizational goals; management of emerging communication and evaluation processes; interacting with boards and with customers are developed across disciplines.

FMBA 602. Team Building and Leadership. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations steer members toward what needs doing. Design, functions and creation of teams, engaging leadership and motivation processes to set and achieve organizational goals; management of emerging communication and evaluation processes; interacting with boards and with customers are developed across disciplines.

FMBA 603. Business Foundations. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how to build a foundation in business quantitative techniques. Concepts of accounting/financial reporting, quality, finance concepts, control and hypothesis testing are developed and integrated across disciplines.

FMBA 604. Analysis and Decisions. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations define and choose. Concepts and tools of problem-solving for administrative decisions; concepts and tools of measurement, planning and control; management of conflict, cooperation, negotiation and implementation are developed and integrated across disciplines.

FMBA 605. Analysis and Decisions. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations define and choose. Concepts and tools of problem-solving for administrative decisions; concepts and tools of measurement, planning and control; management of conflict, cooperation, negotiation and implementation are developed and integrated across disciplines.

FMBA 606. Analysis and Decisions. 1-6 Hours.
Semester course; 1-6 lecture hours. 1-6 credits. Presents how organizations define and choose. Concepts and tools of problem solving for administrative decisions; concepts and tools of measurement, planning, and control; management of conflict, cooperation, negotiation, and implementation are developed and integrated across disciplines.

FMBA 607. Global Challenges. 3 Hours.
Semester course; 3 credits. Presents an educational tour for direct experience of influences and perspectives: France, Great Britain, Indonesia or Mexico.

FMBA 608. Organizational Culture. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations develop and operate. Concepts of information technology-adding values, environmental regulations/law, entrepreneurial culture, probability market orientation and management functions are explored.

FMBA 609. Productivity and Innovation. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations change and improve. Management of creativity, critical thinking and rewards; development of resources; implementing concepts of quality, effectiveness and change are developed across disciplines.

FMBA 610. Productivity and Innovation. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations change and improve. Management of creativity, critical thinking and rewards; development of resources; implementing concepts of quality, effectiveness and change are developed across disciplines.

FMBA 611. Strategic Management. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations define, plan and accomplish missions. Comprehensive integration of business functions and processes; systems thinking, managing shareholder value; anticipating and interacting with changing internal and external environments; formulation and implementation of strategy and integrated across disciplines.

FMBA 612. Strategic Management. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations define, plan and accomplish missions. Comprehensive integration of business functions and processes; systems thinking, managing shareholder value; anticipating and interacting with changing internal and external environments; formulation and implementation of strategy and integrated across disciplines.

FMBA 613. Strategic Management. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presents how organizations define, plan and accomplish missions. Comprehensive integration of business functions and processes; systems thinking, managing shareholder value; anticipating and interacting with changing internal and external environments; formulation and implementation of strategy and integrated across disciplines.

FMBA 614. Health Care Management I: National Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students develop an understanding of how health care evolved in the United States and articulate major policy issues. Course emphasizes the major components of health care reform and what policy issues they are intended to address. Focus is on how information technology supports quality of care, the business of health care and health care reform.

FMBA 615. Health Care Management II: Employer's Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will develop an understanding of the business and financing of health care. Course emphasizes the design of insurance costs, the associated costs and employer options. Also explores how wellness affects population health and health care costs.

FMBA 616. Health Care Management III: Industry Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will develop an understanding of the unique economic issues of health care, the importance of process improvement and compliance for health care organizations and the effect of costs. Course focuses on the roles of innovation and marketing in the health care industry.

FMBA 691. Topics in Business. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Study of current topics. Topics may vary from semester to semester.

Finance, Insurance and Real Estate (FIRE)

FIRE 520. Financial Concepts of Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: MGMT 524, STAT/BIOS 543, STAT 541, or MGMT 301 and MGMT 302. Not open to students who have completed FIRE 311 or the equivalent. A study of the essential concepts of financial management in a global environment, including working capital management, capital budgeting, capital structure planning and dividend policy. This is a foundation course.

FIRE 533. Insurance Education Institute for High School Teachers. 3 Hours.
3 credits. This is a summer course designed for high school teachers in such fields as business, marketing, economics, mathematics, social sciences, history, life skills, home economics, or other disciplines in which the subject of risk and insurance can be incorporated into the curriculum. Teachers will learn about risk management, life, health, auto, homeowners insurance and financial planning. They will receive instructional materials and guidance to develop lesson plans for their use in teaching the subject to their students.

FIRE 620. Introduction to Financial Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of essential concepts of financial management in a global environment, including time value, capital budgeting and valuation, cost of capital structure, divided policy, and working capital management, at a level appropriate to the Master of Management program.

FIRE 621. Cases in Financial Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 623. Analysis, in a global environment, of financial problems and policies of nonfinancial firms, including capital management, capital rationing and cost of capital, and capital structure.

FIRE 622. Financial Management of Financial Institutions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 520. Understanding the application of concepts relevant to the financial management of financial institutions in a global environment.

FIRE 623. Financial Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 520. Analyzes the theory and practice of corporate finance. Detailed investigation of the investment and financing decision of the firm in an environment of uncertainty.

FIRE 625. Group Insurance and Pension Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: FIRE 520 and MGMT 530. Analysis of major elements of employee benefit plans including: life, health and disability benefits, pension, and profit-sharing plans. Design principles, financing, legal and tax considerations are examined. Major issues and new developments. Courses directly related to risk, insurance and employee benefits are approved for Virginia Insurance Continuing Education. Forty-two credits for insurance agents. Contact the director of insurance studies for further information.

FIRE 626. Risk Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 623 or FIRE 635. Property and liability risks faced by businesses and public institutions are studied. Insurance and alternative methods of controlling and financing these risks are analyzed and compared. Courses directly related to risk, insurance and employee benefits are approved for Virginia Insurance Continuing Education. Forty-two credits for insurance agents. Contact the director of insurance studies for further information.

FIRE 627. Real Estate Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the development process; including market analysis, site selection, pre-acquisition strategic planning, and project management.

FIRE 628. Using GIS in Real Estate Decisions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Acquaints students with Geographic Information Systems technology as a means of selecting and comparatively analyzing prospective sites. Students will use GIS software in making location decisions.

FIRE 629. Real Estate Investment Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Housing demand forecasting, commercial site selection, and real estate investment analysis.

FIRE 635. Investments and Security Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: FIRE 520; and MGMT 524, STAT/BIOS 543, STAT 541, or MGMT 301 and MGMT 302. The process of investing in stocks and bonds in a global environment, from the analysis of individual securities to portfolio formation and evaluation, using experiential analytic exercises.

FIRE 638. Real Property Investment Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 323 or MGMT 530. Covers legal aspects of real property development from acquisition through disposition; emphasizes selection of appropriate ownership form, financing, operation, and tax considerations.

FIRE 639. International Finance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 520. A study of financial management of multinational enterprises, banks, firms with foreign subsidiaries, exporters, and service industries. Additionally, financing trade and investments, international money and capital markets, foreign exchange risks, and governmental policies will be covered.

FIRE 650. Derivatives. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 520. Analysis of derivatives contracts: forwards, futures, swaps and options. Study of valuation, pricing and use of derivatives to manage risk in a global environment.

FIRE 654. Short-term Financial Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 520. Techniques of short-term financial management (or working capital management) in a global environment for business firms, including understanding payment systems to achieve efficient cash management of accounts receivable, management of inventory, management of accounts payable, and short-term borrowing from banks and other suppliers of short-term credit.

FIRE 657. Current Issues in Investments and Markets. 3 Hours.
3 lecture hours. 3 credits. Prerequisite: FIRE 635. Advanced study of selected topics in global investments and securities markets using experiential exercises. Topics selected by the instructor. Readings from recent journals, cases, and/or software may be used. Possible topics may include: fixed income mathematics; portfolio management; advanced investments theory; factors explaining security price movements; advanced security analysis; using information to make investment decisions; and security market microstructure.

FIRE 658. Real Estate Finance and Investments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 431. Emphasizes economic and financial analysis of commercial real estate investments, alternative financing structures and surveys recent trends in the securitization of commercial real estate debt and equity markets.

FIRE 664. Current Issues in Corporate Finance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: FIRE 623. Advanced study of selected topics in corporate finance and financial management in global entrepreneurial settings. Topics selected by the instructor. Readings from recent journals, cases and/or software may be used. Possible topics include: theory and evidence concerning major corporate financial policy decisions, bankruptcy costs and agency costs that relate to capital structure and dividend policy, issues in corporate control, alternative methods of issuing and retiring securities mergers and acquisitions, advanced valuation theory, advanced financial analysis, advanced capital budgeting, using information to make financial decisions.

FIRE 690. Research Seminar in Finance, Insurance and Real Estate. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. This course is designed to provide research experience for candidates not following the FIRE 798-799 program.

FIRE 691. Topics in Finance, Insurance and Real Estate. 1-3 Hours.
Semester course; 1-3 lecture hours. 1, 2 or 3 credits. Prerequisites vary by topic. Study of current topics. Topics may vary from semester to semester.

FIRE 693. Field Project in Finance, Insurance and Real Estate. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a practical research project using experiential exercises. A written report of the investigations is required. To be taken at the end of the program.

FIRE 697. Guided Study in Finance, Insurance and Real Estate. 1-3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students wishing to do research on problems in business administration or business education in an international environment will submit a detailed outline of their problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

Information Systems (INFO)

INFO 609. Data-centric Re-engineering Analysis/Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Teaches methods of monetizing or otherwise valuing intangible data practice-improvement opportunities. Students will participate in a semester-long residency in organizations. Student teams will work closely with CIOs. Each team will evaluate operational effectiveness and/or innovation opportunities and recommend specific approaches and estimated benefits. Participating CIOs will receive a professional business case -- including concrete examples -- for implementing data-centric practices in their organizations.

INFO 610. Analysis and Design of Database Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 364. Designed to prepare students for the development of information systems using databases and database management techniques.

INFO 611. Data Re-engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Teaches the process of reengineering data from current to desired structures. Covers a range of methods, tools and techniques for reverse engineering existing schemas and data structure definitions used as the basis for designing more suitable data structures. Appropriate case tools provide students with practical experience.

INFO 614. Data Mining. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 302, SCMA 302, SCMA 524 or permission of the instructor. A data mining process has the goal of discovering nontrivial, interesting and actionable knowledge from data in databases. The course introduces important concepts, models and techniques of data mining for modern organizations. Students gain a deeper understanding of concepts and techniques covered in lectures by doing a practical term project that applies one or more of the data mining models and techniques. Students also are given the opportunity to gain knowledge on the features and functionalities of state-of-the-art data mining software through their preparation of a research report.

INFO 616. Data Warehousing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 610. Covers important concepts and techniques in the design and implementation of a data warehouse. Topics include the data warehouse architecture, the logical and physical design issues in the data warehousing development process, technical factors (i.e., hardware, client/server technology, data warehousing and DBMS technologies) and implementation considerations (i.e., data extraction, clean-up and transformation tools). Introduces online analytical processing and data mining. Crosslisted as: CISS 616.

INFO 620. Data Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 370. Computer network design, communication line control, and communication hardware and software.

INFO 622. Internet Security Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Studies the principles of network security and secure operating systems. Included are topics relating to the use of intrusion detection, intrusion prevention and other related tools.

INFO 630. Systems Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: INFO 361 and 364. Covers business process and data requirements modeling for information systems, using advanced methods and techniques. Students will gain hands-on experience developing specifications and a functional prototype application with current CASE and development tools.

INFO 632. Business Process Engineering. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Critically reviews business process (re)engineering methods and practices. The discipline of Business Process and Application Architectures and modularization are examined. Issues in the implementation of application support for business processes are discussed. The discussion includes strategy visioning, performance benchmarking, process modeling and analysis, and planning organizational change. State-of-the-art business engineering tool-sets such as SAP Business Engineer and J.D. Edwards Business Engineering tool-sets are extensively used to provide practical experience.

INFO 640. Information Systems Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A detailed study of the issues, principles, techniques and best practices in managing information systems and enterprise knowledge as organizational resources. Managing enterprise knowledge and information systems involves taking a disciplined approach to managing the infrastructures and harnessing the collective knowledge capital and brain-power of individuals and organizations. Topics include: IT operations, issues in strategic management, establishing standards and procedures, performance evaluation and benchmarking, hardware and software acquisition, physical environments and security issues, outsourcing and partnerships, personnel, knowledge ontology, meta-knowledge and others.

INFO 641. Strategic Information Systems Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or INFO 661. Focuses on developing, implementing and evaluating strategic plans for corporate information systems. Assesses the role of information systems as a competitive tool. Methods and frameworks for strategic analysis are introduced. Mechanisms for establishing an information systems strategy are presented. Emphasis placed on understanding change management issues in IS planning for organizations.

INFO 642. Decision Support and Intelligent Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: INFO 610 and 630. Focuses on the design and deployment of decision technology of two broad types: decision support systems, which are meant to be employed in an advisory capacity by their human users, and intelligent systems, which are generally designed as autonomous decision agents and so intended to displace human functionaries.

INFO 643. Information Technology Project Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or 661 or permission from the director of graduate studies in the School of Business. Provides a clear understanding of project management techniques. Covers aspects of planning, organizing, controlling and implementing IT projects. IT project management processes, project scheduling and links with information systems strategy and change management are explored.

INFO 644. Principles of Computer and Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or INFO 661. Explores issues related to protecting information resources of a firm. Various tools and techniques useful for assessing CISS security concerns in organizations are introduced. Principles and models for CISS security and security management are presented and selected computer and CISS security topics are introduced. Material is presented and discussed from a management frame of reference. Crosslisted as: CISS 644.

INFO 646. Security Policy Formulation and Implementation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Course covers aspects of policy formulation and implementation. A security policy is considered as a vehicle for executing good strategy. The course analyzes current problems with security strategy formulation and compliance. The content and context of security policies is evaluated to ensure effectiveness.

INFO 654. Systems Interface Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 640 or 661. Analyzes factors important in designing the interface for business information systems. Includes designing and developing systems for the Internet. Requires students to work in teams to produce prototype interactive systems.

INFO 658. Securing the Internet of Things. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: INFO 661 or INFO 640. Overviews the emerging field of the Internet of Things with emphasis on how information infrastructure and networks will change the exchange of goods and services in a socially connected world. Specific topics include technological (including hardware/software) infrastructures, types of IoT applications, key IoT policy issues and future trends, IoT security, and privacy challenges in a socially connected world.

INFO 661. Information Systems for Managers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an understanding of the importance and role of information systems in modern business decision making. Emphasizes choices about information technology and managing projects.

INFO 664. Information Systems for Business Intelligence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students with techniques and practices for modern decision-making in support of business/corporate performance. Includes hands-on experience with various information analysis, business intelligence and decision support techniques and tools with applications to various business-problem scenarios, such as portfolio analysis, project selection, market research and supply-chain optimization.

INFO 690. Research Seminar in Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. This course is designed to provide research experience for candidates not following the INFO 798-799 program.

INFO 691. Topics in Information Systems. 1-3 Hours.
Semester course; 1-3 lecture hours. 1, 2 or 3 credits. Study of current topics. Topics may vary from semester to semester.

INFO 693. Field Project in Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a practical research project. A written report of the investigations is required. To be taken at the end of the program.

INFO 697. Guided Study in Information Systems. 1-3 Hours.
Semester course; 3 lecture hours. 1, 2 or 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students wishing to do research on problems in business administration or business education will submit a detailed outline of their problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

INFO 700. Survey of Information Systems Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to provide incoming Ph.D. students with an introduction to information systems research. Students will survey various research streams in the field of information systems by familiarizing themselves with the research undertaken by faculty in the IS department. During the semester, students will learn about the various research areas in light of theories that support research and the primary research methods used in these areas. In addition, students will review literature to identify critical research issues in a specific topic area chosen for research and propose solutions to address those issues.

INFO 701. Qualitative Research in Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. The course is designed to cover qualitative research published in the information systems discipline and an array of qualitative research methods, including but not limited to grounded theory, positivist case studies, interpretive case studies, hermeneutics, ethnography, action research and interviewing methods. Students will be exposed to the published literature of qualitative research in the IS discipline, as well as to the principles that distinguish qualitative research from other types of IS research. The research methods and techniques will be discussed using published examples of such research. Including a project, the course will help students conduct their own qualitative research.

INFO 702. Design Science Research and Methods in Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. The course is designed to explore the theories and methods that are used in the various phases of design science research. Students will be exposed to the principles that distinguish design science research from other types of information Systems research. The research methods and techniques used in the various phases of design science research will be discussed using examples from IS analysis and design, database, IS security, decision support and intelligent systems, knowledge management, or other subfields.

INFO 710. Database Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores advanced concepts related to management of modern organizations' data resources. Focuses on data administration and the technical aspects of database systems. Some of the database research issues covered include: data quality, design, security, metadata, XML databases and data warehousing. Prepares students for further research into aspects of database systems.

INFO 720. Analysis and Design of Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the philosophical and theoretical foundations of information systems development methodologies and their evolution. Provides an intellectual foundation for students wishing to write a doctoral dissertation in this subject matter. Students will be required to read and analyze articles considered fundamental to the current understanding of the subject.

INFO 730. Information Systems Strategy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the basis for further Ph.D.-level work in information systems strategy. Covers the theoretical foundations of the subject area. In particular the economic, phychological, sociological and cultural aspects are considered. This focus helps students to identify different research orientations and helps develop an informed opinion on critical research areas.

INFO 740. Decision Support and Intelligent Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the basis for further Ph.D.-level work in decision support and intelligent systems. Explores the theoretical and technical aspects of the subject area. It helps students identify different research orientations with respect to the notion of intelligent systems and build an informed opinion on critical research areas. Explores issues around classes of decision predicates and decision situations. The course also helps students understand technical innovations in decision technologies as they relate to the study of decision support and intelligent systems.

INFO 750. Information Systems Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the basis for further Ph.D.-level work in information systems security. Covers the theoretical aspects of the subject area. It helps students identify different research orientations with respect to IS security and build an informed opinion on critical research areas. Explores issues around what IS security is (ontology) and how to acquire the relevant knowledge (epistemology). The course also helps students understand methods of social science research as they relate to IS security.

INFO 760. Knowledge Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores advanced concepts related to knowledge management and knowledge discovery in modern organizations. Material for the course is drawn from research papers and doctoral dissertations. Requires a high level of student participation, particularly in their critical reviews and presentation of relevant research materials.

INFO 790. Doctoral Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Analyzes and critiques general theories, practices and functions in a specialized area of information systems research.

INFO 798. Thesis in Information Systems. 3 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

INFO 799. Thesis in Information Systems. 3 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

INFO 898. Dissertation Research in Information Systems. 1-12 Hours.
1-12 credits. Limited to Ph.D. in business candidates.

Management (MGMT)

MGMT 540. Management Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A foundation course that presents theories, principles and fundamentals applicable to contemporary management thought and productive activities.

MGMT 633. Issues in Labor Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The conceptual framework of labor relations; the interconnection between labor-management relations and the sociopolitical environment.

MGMT 634. Collective Bargaining and Labor Arbitration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The negotiation and administration of collective bargaining contracts; the handling of grievances.

MGMT 637. Advanced Human Resource Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MGMT 540 and MGMT 524. Provides exposure to the process of managing human resources; focuses on issues concerned with business decisions about acquiring, motivating and retaining employees. Topics may include HRM planning, recruitment, selection, training, performance management, compensation and strategic human resource management. Emphasis will be given to the development, implementation and assessment of human resource management policies and practices consistent with business, legal, environmental and strategic dynamics.

MGMT 641. Leading People and Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted students who have completed all M.B.A. foundation courses or equivalent, or by permission from the graduate studies in business office. An advanced course in management involving theories and models aimed at developing the managerial competencies needed to analyze, understand, predict and guide individual, group and organizational behavior.

MGMT 642. Business Policy and Strategy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: completion of five of the following courses -- MGMT 641; MGMT 675; ACCT 608; ECON 610; FIRE 621 or FIRE 623; INFO 661; INFO 664; MKTG 671. Integration of principles and policies of business management from the fields of accounting, economics, marketing, finance, statistics and management in the solution of broad company problems and in the establishment of company policy. Emphasis on interaction of disciplines in efficient administration of a business. Course employs case analysis approach.

MGMT 644. International Business Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: ECON 500, MGMT 530, MGMT 540 and MKTG 570. Survey course for students interested in international and multinational management. Review of historical, governmental, monetary, and cultural issues affecting the transfer of resources and management knowledge across national boundaries; multinational business and management strategies; study of management practices in selected countries.

MGMT 649. Compensation Policy and Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 637. Analysis of the concepts and processes involved in compensation systems. Includes evaluation of the internal and external dimensions of compensation, policy issues involved, concepts, and forms of compensation, administration of compensation systems, and current and future issues.

MGMT 654. Negotiations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An advanced course in management using an experiential approach to explore the practice and theory of negotiation. Topics will include basic approaches to negotiation and conflict management, negotiating in teams, negotiating with agents, ethics in negotiations and international negotiation.

MGMT 655. Entrepreneurship. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Individual and corporate entrepreneurship in high and low technology enterprises. Develops an understanding of the role of entrepreneurship in management theories and practices. Students will develop comprehensive venture analysis plans for presentation.

MGMT 656. Best Practices in Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate standing. A seminar and experiential exercise course designed to raise the student's practical awareness of major leadership behavior patterns and strategies that promote effectiveness in organizations; raise awareness, flexibility and skill with the student's own personal leadership style; and help students practice, discuss and develop the ability to influence others over whom they may or may not exert positional authority.

MGMT 680. Health, Safety and Security Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: MGMT 524; and MGMT 530 or 540. Study of design and development of an effective safety or risk-control program. Topics include organizational needs and assessment, program evaluation, design/implementation of critical program components, training, accident cost-accounting, cost containment. Also addresses management strategies, communication techniques, motivation and incentive programs and other special topics.

MGMT 682. Human Resource Staffing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 637. Addresses the activities and processes that affect the staffing function. Subjects include attracting, selecting, and retaining people who will facilitate the accomplishment of organizational goals. Designed for the future human resource professional who will be involved with designing, administering, revising, and evaluating selection programs and procedures.

MGMT 684. Issues in International Human Resource Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 637 or MGMT 641. Focuses on issues affecting the application of human resource management practices in an international environment. Examines current challenges in the selection, appraisal, development, compensation and maintenance of expatriates, repatriates, host country nationals and third-country nationals. Includes contextual factors of industrial relations systems, legal environment, demographics and culture.

MGMT 691. Topics in Management. 1-3 Hours.
Semester course; 1-3 lecture hours. 1, 2 or 3 credits. Study of current topics. Topics may vary from semester to semester.

MGMT 693. Field Project in Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a practical research project. A written report of the investigations is required. To be taken at the end of the program.

MGMT 697. Guided Study in Management. 1-3 Hours.
Semester course; 3 lecture hours. 1, 2 or 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students wishing to do research on problems in business administration or business education will submit a detailed outline of their problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

MGMT 702. Causal Analysis for Organizational Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: two graduate courses in statistics or permission of instructor. Focuses on conceptual and statistical issues involved with causal analysis with nonexperimental and experimental data. Course covers basic and advanced confirmatory factor analysis and structural equation techniques, with an emphasis on organizational and psychological applications. Crosslisted as: PSYC 702.

MGMT 703. Advanced Topics in Research Methods for Organizational Studies. 1,2 Hour.
Continuous course; 3 lecture hours. 3 credits. Prerequisities: MGMT 632 or equivalent and permission of instructor. Students must enroll for two semesters. Extensive coverage of applications of methodological and statistical analyses to an array of disciplines related to organizational studies. Emphasizes the skills essential in designing, conducting and interpreting research. Course contact hours spread over fall, intersession and spring semesters. Credits alloted one in fall and two in spring. May be repeated once for credit as topics change each year.

MGMT 737. Seminar in Human Resources. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 637 or equivalent, or permission of intructor. Provides broad exposure to theory and research in the field of human resource management. Topics include strategic and operational human resource planning and staffing; employee relations, development and performance management; external factors such as legal and international environments; and compensation policy and practices.

MGMT 738. Special Focus in Human Resource Management: ____. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 637 or equivalent, or permission of instructor. Provides exposure to specific advanced theoretical and methodological topics related to human resource management. Topics may include staffing, training and development, motivation (i.e., compensation and rewards), HRM metrics, and validity generalization. Topics vary depending upon instructor. See the Schedule of Classes for specific topics to be offered.

MGMT 743. Organizing Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 524 or equivalent, or permission of instructor. Surveys the foundations of management theory as well as more recent research and theory on the leadership through which work is organized and directed.

MGMT 745. Advanced Operations Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 645 or equivalent. Advanced discussion of topics in mathematical programming and network analysis as applied to organizational decision making. Includes network flows, integer, nonlinear, and dynamic programming, and multicriteria optimization. Emphasis on applications and the use of the computer for problem solving.

MGMT 746. Cognitive and Emotional Processes in Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 524 or equivalent. This course examines organizational life in terms of cognitive and emotional processes at the individual, group, and organizational level. Special attention will be given to how people perceive and evaluate each other.

MGMT 747. Seminar in Human Resources: Macro Foundations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 737 or equivalent, or permission of instructor. Provides broad exposure to theory and research of how firms can use human resource management practices to enhance individual and organizational performance. Topics include emerging theoretical perspectives related to HRM systems, human capital, contextual factors and other factors that influence the linkages between human resources and performance.

MGMT 749. History of Management Thought. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 540. Traces the history of management from its beginnings to current approaches and theories.

MGMT 750. Attitudes and Motivation in Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 524 or equivalent. Critical examination of classic and emerging research on attitudes and motivation in organizations, as well as their relationships to individual and organizational outcomes.

MGMT 757. Corporate Strategy and Long-range Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MGMT 642 or equivalent. Analysis and evaluation of current methods and research in the areas of corporate strategy and long-range planning.

MGMT 790. Doctoral Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to Ph.D. students in business. Analyzes and critiques general theories, practices and functions in a specialized area of management research.

MGMT 798. Thesis in Management. 3 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

MGMT 799. Thesis in Management. 3 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

MGMT 898. Dissertation Research in Management. 1-12 Hours.
1-12 credits. Limited to Ph.D. in business candidates.

Management – Master's (MSTM)

MSTM 601. Survey of Financial and Managerial Accounting. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students enrolled in the Master of Management program. An introduction to the essential concepts of financial and managerial accounting in a global environment, including working capital management, capital budgeting and capital structure planning.

MSTM 602. Fundamentals of Financial Management. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students enrolled in the Master of Management program. A study of the essential concepts of financial management in a global environment, including working capital management, capital budgeting, capital structure planning and dividend policy.

MSTM 603. Essentials of Market Planning and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Presents and analyzes buyers and sellers in the marketplace, including how firms/organizations assess, analyze, create, deliver and capture value. Course incorporates the importance of customer-driven strategies and tactics for not-for-profit and public-sector organizations, as well as for-profit firms. Provides a framework for analyzing the impact of external forces on marketing decision-making, as well as the need for marketers to be ethical and socially responsible in the development and implementation of marketing plans. This framework extends not only to the traditional, domestic marketing environment, but also to global and technologically evolving (e.g., Internet) market settings.

MSTM 604. Quantitative Methods in Management. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students enrolled in the Master of Management program. Students will develop an ability to interpret and analyze business data in a managerial decision-making context. Managerial applications are stressed in descriptive statistics, probability, sampling, estimation, hypothesis testing, simple regression and correlation analysis.

MSTM 605. Managing Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Explores the fundamental principles of management theory and practice as well as organizational behavior. Provides an understanding of teams, management principles, change and innovation within an organization.

MSTM 606. Introduction to Management Information Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Provides an understanding of the importance and role of information systems in modern business processes, analysis and decision-making. Presents principles of information technology and systems methodologies for the design and development of operational, managerial and strategic business information systems. A project management focus will provide the framework for the course.

MSTM 607. Production and Operations Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Examines concepts relating to the operations function in both manufacturing and service organizations. The operations process is responsible for planning, organizing and controlling of resources to efficiently and effectively produce goods and services that meet organization goals. Quantitative tools of analysis used to support decision-making in the various operations management activities will be surveyed and case analysis will be employed to relate theory to practice.

MSTM 608. Customer Service Quality Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Designed to enable students to understand and use appropriate concepts, frameworks and theoretical models to facilitate analysis of different types of services and customer-service settings, as well as to be able to contribute to the development and implementation of appropriate service strategies. Emphasizes other key issues facing service firms/organizations, such as managing supply and demand, the overlap in marketing/operations/human resource systems and the importance of relationship management.

MSTM 609. Management of Human Capital. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Provides an overview of human resource issues and the process of managing human resources. Topics may include HRM planning, recruitment, employee development, performance management, compensation and strategic human resource management.

MSTM 610. Managerial Perspectives in a Global Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Emphasizes the social, legal, political and ethical responsibilities of a business to internal and external stakeholders, including investors, employees, the community and the environment. Students learn about the interconnectivity between business and natural, social and financial environments, as well as about the need to maintain and balance these to sustain current and future generations.

MSTM 620. Master of Management Project Course. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Students integrate the knowledge and experience gained from courses in various business fields in order to solve a management problem for a real company. Students use a team approach and work collaboratively to analyze the problem and recommend solutions. Students will also create reports of their work using a variety of media.

Marketing (MKTG)

MKTG 570. Concepts and Issues in Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed for graduate students with little or no undergraduate education in marketing. A study of the philosophy, environment and practice of contemporary marketing. This is a foundation course.

MKTG 656. International Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: MKTG 671. Orientation to the international market place. Formulation of international marketing strategies for firms participating in global trade. Emphasis on international environment, multinational economic blocs, international competition and development of international marketing strategies.

MKTG 657. International Market Planning Project. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MKTG 656; pre- or corequisite: MKTG 671. This course is a comprehensive real-life, field-based research and strategic planning exercise. A team of graduate business students is matched with a Virginia business that is interested in initiating or expanding export sales. Under the supervision of the instructor, the student team develops an international market plan for the client company. The team functions as an international business consultant to its assigned company.

MKTG 670. Essentials of Market Planning and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students enrolled in the Master of Management program. Presents and analyzes buyers and sellers in the marketplace, impact of external forces on marketing, customer-driven strategies and tactics, creation of market-driven competitive advantage, responsible and ethical marketing, Internet and global marketing.

MKTG 671. Marketing Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Detailed study of concepts and procedural alternatives in the delineation of the market target, the development and implementation of the marketing mix, and the control and analysis of the total marketing effort.

MKTG 672. Concepts in Consumer Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: MKTG 671. A study of the pertinent psychological, sociological and anthropological variables that influence consumer activity and motivation.

MKTG 673. Marketing Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 543, SCMA 302, SCMA 524, STAT 541 or STAT 543; pre- or corequiste: MKTG 571. A discussion of the techniques of marketing research. Special emphasis will be given to marketing problem definition, determination of information needs and current methods of analysis of marketing data.

MKTG 674. Service Quality Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: MKTG 301 or MKTG 671. This course enables marketing students to develop a better understanding of service offerings from both a theoretical and practical perspective. Learning will focus on both private and public-sector service organizations. Students will learn how to analyze the design of service offerings, including operations, environment and people, and make recommendations for improving the offerings. The importance of internal and external customer feedback and continually measuring customer satisfaction/dissatisfaction will be highlighted as an integral part of managing service quality.

MKTG 675. Digital Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MKTG 301; pre- or corequisite: MKTG 671. Focuses on the basic digital tools available to marketers. The strategic value of digital marketing to the organization as it relates to the buyer behavior model is explored through lecture, cases, guest speakers and a group project. The group project teams partners with local companies to gain practical experience with digital marketing.

MKTG 678. Marketing Analytics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SCMA 524 or STAT 541. Develops and sharpens students' analytical and statistical skills in preparation for advanced marketing decision-making. Analyses and statistical techniques covered include descriptive statistics, cross-tabulation, analysis of variance, regression and cluster analysis applied to marketing phenomena.

MKTG 679. Brand Strategy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will provide students with an understanding of how to formulate strategies for building, leveraging and growing strong brands in an increasingly dynamic and competitive environment. It will address a variety of relevant concepts, including customer and market analysis, brand positioning and brand equity. Students will consider how to design and implement effective brand-building programs and how to measure brand performance. Importantly, the course will emphasize the organizational and individual characteristics necessary for successful strategic brand management.

MKTG 690. Research Seminar in Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. This course is designed to provide research experience for candidates not following the MKTG 798-799 program.

MKTG 691. Topics in Marketing. 1-3 Hours.
Semester course; 1-3 lecture hours. 1, 2 or 3 credits. Study of current topics. Topics may vary from semester to semester.

MKTG 693. Field Project in Marketing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a practical research project. A written report of the investigations is required. To be taken at the end of the program.

MKTG 697. Guided Study in Marketing. 1-3 Hours.
Semester course; 3 lecture hours. 1, 2 or 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students wishing to do research on problems in business administration or business education will submit a detailed outline of their problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

MKTG 798. Thesis in Marketing. 6 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

MKTG 799. Thesis in Marketing. 6 Hours.
Year course; 6 credits. Graduate students will work under supervision in outlining a graduate thesis and in carrying out the thesis.

Sport Leadership (SPTL)

SPTL 591. Topical Seminar. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. A seminar intended for group study by students interested in examining topics, issues or problems related to health, physical education, exercise science, recreation and sport. Crosslisted as: HEMS 591.

SPTL 603. Research Methods in Sport. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to help graduate students acquire the fundamental skills of evaluating peer-reviewed research, while also facilitating the development of student research projects. Course offers an introduction to market research, an important aspect in today's sport environment and industry, and will help students determine and defend problems in sport from a statistical perspective, bringing more credibility to their stance.

SPTL 604. Research Practicum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SPTL 603. Focuses on conceptualizing and writing a professional paper or the first part of a research study (either RPSL 797 Research Project or RPSL 798 Thesis) on a topic in recreation, parks and sport leadership chosen by the student in consultation with the instructor and adviser. Emphasizes problem identification, literature review and research design.

SPTL 607. Field Instruction. 3 Hours.
Semester course; 150-360 clock hours. 3 credits. Enrollment only by permission of adviser. Application of theoretical knowledge as a practicing professional in a recreation, parks or sport agency or enterprise. A faculty member and field supervisor assess basic knowledge, attitudes and skills necessary to function as a provider or manager or leisure services or sports system.

SPTL 608. Sport and Entertainment Event Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The first semester of a two-course sequence designed to allow graduate students to acquire the fundamental skills needed to plan events in all areas of the sport and entertainment industry, including planning and event design, understanding financial contracts, facility and security risk management, marketing and promotions, and implementation and control methods. By the completion of the sequence (SPTL 608/SPTL 610), students will have designed, planned and implemented an actual event that will take place at the end of the spring semester.

SPTL 610. Sport and Entertainment Event Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SPTL 608. Designed to allow graduate students to acquire the fundamental skills needed to plan events in all areas of the sport and entertainment industry, including planning and event design, understanding financial contracts, facility and security risk management, marketing and promotions, and implementation and control methods. By the completion of the two-course sequence (SPTL 608/SPTL 610), students will have designed, planned and implemented an actual event that will take place at the end of the spring semester.

SPTL 622. Sport Consumer Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course focuses on the importance of understanding consumer behavior within contemporary sport. Students will gain an appreciation for how understanding and influencing sport consumer behavior is a fundamental marketing/management strategy, and how an understanding of consumers (fans) enables sport marketers and managers to more effectively meet the needs of buyers in the market. The course explores psychological, social, situational and marketing factors that influence the selection and usage of sport products and services.

SPTL 623. Sport and the Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to explore the relationship between sport and the environment. Specifically, the course will investigate (a) the ways in which sport (participant and spectator) effect the natural environment, (b) the ways the natural environment effect sport and (c) the stewardship role sport can play with respect to environmental issues.

SPTL 630. Sociology of Sport. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to sport leadership majors. Provides a systematic study of human behavior as it occurs in and is influenced by social groups, institutions, organizations and societies. Provides an understanding of sport as a social phenomenon and examines principles that govern social behavior and sport. Identifies the consequences of various social structures and critically examines these consequences based on the student's own ethical and moral positions.

SPTL 631. Contemporary Issues in Sport. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to sport leadership majors. Provides the opportunity to investigate contemporary issues in sports today. Issues utilized for discussion include ethics and values in sport, athlete's rights and issues, ownership rights and issues, media in sports and media's impact on sports, sports agents, women in sport business, Title IX and gender equality, and the NCAA.

SPTL 632. Sport Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to sport leadership majors. Provides an in-depth examination of pertinent aspects of business and law as applied to the sports industry. Topics include contract and tort, risk and reliability, organization structure and management, budget and business plans, and facility management. Provides the basic principles of business and law necessary for successful entry into sports related careers.

SPTL 633. Marketing of Sport. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Will familiarize the student with practical aspects of sports marketing including the dynamic nature of sport marketing and the importance of branding. Through lecture and case-study analysis, the course will provide students with the understanding of the importance of marketing theory and fundamentals specific to the marketing of sport. Designed to introduce students to marketing within the sport industry, including understanding the unique aspects of sport as product, the sport consumer market and the sport product market.

SPTL 634. Foundations of Coaching. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to sport leadership majors. Acquaints the student with principles, techniques and functions related to coaching and administrative fundamentals for any sport. Special emphasis on communication, motivation, organization and team building for success. Provides an understanding and overview of multiple elements that contribute to successful and productive coaching of athletes and managing athletics programs.

SPTL 635. Leadership Models in Sport. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to sport leadership majors. Acquaints the student with principles, techniques and functions related to management and leadership in all organizations. Focuses on the impact of leadership on organizations and their members. Discusses key ingredients of successful management and visionary leadership.

SPTL 640. Sport Media and Communications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of the converging worlds of journalism, public relations, marketing and advertising as expressed in the new commercial reality of sport. Students will be provided with a history of sports media and the changes the media has undergone in recent years. Students will learn the many reasons media relations are important as well as methods to make sure those relations are strong with sport entities. Students will also have the opportunity to be placed in the media chair and produce written material as a reporter covering a team or an athletic program.

SPTL 641. Sports Psychology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of the discipline of sports psychology designed to facilitate an understanding and application of mental skills as well as to provide an understanding of other applied domains, such as life skills within sport psychology. Goal setting, relaxation, imagery, burnout and communication are some of the key issues examined.

SPTL 642. Sport Ethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Offers an application of the tools of moral reasoning and ethics to the management of sports and recreation programs. This class places students in ethical decision-making situations within the sport industry and provides the tools necessary to effectively navigate these circumstances.

SPTL 643. Sport Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An application of basic principles of law to the management of sports, events, teams, organizations, educational institutions and facilities. This course will involve the study of the application of various legal doctrines to a broad range of sports-related activities. Particular areas of the law that will be discussed include contracts, labor law, antitrust, taxation, torts, remedies, arbitration and constitutional law.

SPTL 644. NCAA Collegiate Coaching. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to prepare students for the daily responsibilities of assistant and head NCAA coaches by gaining knowledge and confidence through working with camps, managing a budget and developing an understanding of the NCAA rules and regulations. At the conclusion of the course, students will understand the many principles needed to be a successful coach at the collegiate level.

SPTL 645. Sales and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide students with an in-depth analysis of sales and fundraising management, emphasizing strategies and techniques, sales presentations, professional image, product/service knowledge, customer relations, sales ethics, and return-on-investment. Additional topics will explore various aspects of development including annual fund management, corporate and foundation relations, prospect research, special events, major gifts, capital campaigns and gift planning.

SPTL 646. Facilities and Event Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to help graduate students acquire the fundamental skills needed to plan different types of events, from facility design to determining the nuts and bolts of event design and implementation.

SPTL 647. Global Sports Issues. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide a systematic study of human behavior as it occurs in and is influenced by social groups, institutions, organizations and societies pertaining to sports beyond the United States. Through this course students will gain a better understanding of sport as a social phenomenon (economically, politically, religiously, educationally, etc.) throughout the world.

SPTL 648. Issues in College Athletics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course seeks to identify contemporary issues and challenges in intercollegiate athletics. A primary objective is that students be cognizant of issues and concerns in sport, which may have a direct bearing in their future involvement in sport at the collegiate level. In addition, students will be encouraged to think critically about the current state of intercollegiate athletics and provide practical solutions for the sustainable growth and prosperity of athletic departments, student-athletes and institutions of higher education.

SPTL 650. European Model of Sport. 3 Hours.
Semester course. 3 lecture hours. 3 credits. An opportunity for students to get a first-hand examination of how sports principles and techniques are carried out overseas. Students will learn the global business of sport through class sessions, tours and events with top sport professionals in Europe. This class provides an excellent chance to gain access to a distant market and build contacts and networks, while growing culturally in the understanding of sport on a global scale.

SPTL 651. Advanced Coaching Techniques. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students in the coaching track. Designed to provide students who have career aspirations of coaching an in-depth analysis of the profession and its challenges. Students will examine topics including coaching philosophies, networking, recruiting, marketing, fundraising, crisis management and other pertinent topics.

SPTL 691. Topics in Sport Leadership. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for 9 credits. Check with department for specific prerequisites. A course for the examination of specialized issues, topics, readings or problems in sport leadership.

SPTL 692. Independent Study. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 9 credits. Determination of the amount of credit and permission of the instructor and department chair must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in recreation.

SPTL 695. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a total of 6 credits. Prerequisites: permission of the fieldwork supervisor or executive director, and completion of 24 graduate credits. Restricted to sport leadership majors. Plan of work designed by the extern with prior approval of the offering program. Off-campus planned experiences for advanced graduate students designed to extend professional competencies in recreation, parks and sport leadership. Directed by university faculty in cooperation with placement site directors.

SPTL 701. Seminar in Sport Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Must be taken for a total of 3 credits. Restricted to students in the sport leadership track of the Ph.D. in Education program. Provides students with a broad, comprehensive understanding of academic research as it relates to the sport industry. This course is designed to fully engage students in the research process, including exploration of journals in the area of sport management and leadership, developing a literature review, overview of the manuscript review process and collaboration with faculty within the university and across the country. Students will also learn to prepare for academic research presentations at regional and national conferences and submit first-author manuscripts for scholarly journals.

SPTL 702. Seminar in Sport Leadership and the Profession. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students in the sport leadership track of the Ph.D. in Education program. The course is designed to provide students with a broad, yet comprehensive preparation for a career in academe and offer a general sense of university structure and of the breadth of opportunities in higher education. Students will also explore their vision of "being a professor" and discuss timely and pressing topics in the field of sport leadership and academia, as well as receive assistance in the job-search process.

Supply Chain Management and Analytics (SCMA)

SCMA 500. Quantitative Foundation for Decision-making. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: MATH 141, MATH 151 or SCMA 171. A review of basic algebra with emphasis on differential and integral calculus and their application in solving business problems. These topics also provide the necessary foundation for using and understanding more advanced quantitative procedures. May not be included in the 30 semester credits of advanced work required for any of the master's degrees offered by the School of Business.

SCMA 524. Statistical Fundamentals for Business Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SCMA 171, SCMA 212, SCMA 500 or MATH 200. Develops an ability to interpret and analyze business data in a managerial decision-making context. Applications are stressed in the coverage of descriptive statistics, contingency tables, probability, sampling, correlation, confidence interval estimation, hypothesis testing and regression analysis. Business-oriented computational software will be used for data visualization and analysis. This is a foundation course.

SCMA 530. Fundamentals of the Legal Environment of Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The legal environment of business is examined in view of common law principles, statutory provisions and administrative regulations affecting various forms of business organizations and management obligations to the company, its owner and the public. Role of ethics and key commercial law areas are examined including Uniform Commercial Code Provisions.

SCMA 602. Global Supply Chain Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course explores supply, operations and logistics processes and how these processes are integrated with other functions within the firm and across organizations. The objective of this course is to provide students with knowledge of the fundamentals of supply chain management and how those concepts apply to business practice in a global setting.

SCMA 603. SAP ERP and Supply Chain Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course focuses on the concept of enterprise information systems as the application of information technology to support the integration of organizational processes. SAP ERP software applications will focus on the design, plan and control of supply chain management processes. Students will have extensive hands-on activities, assignments and cases using a live SAP ERP system.

SCMA 606. Supply Chain Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students are introduced to cross-disciplinary principles pertaining to creativity, design, invention and innovation. The focus is learning and applying problem-solving methodologies to address complex, open-ended supply chain problems. Innovation from individual and team perspectives is addressed to hone more comprehensively students' problem-identification, information-gathering, conceptualization, evaluation and selection skills.

SCMA 632. Statistical Analysis and Modeling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543, SCMA 302, SCMA 524, STAT 541 or STAT 543. Statistical analysis and modeling with an applied focus on regression modeling, analysis of variance and data collection planning. Use of business-oriented computational software will be integral to statistical analysis of data.

SCMA 643. Applied Multivariate Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SCMA 524, STAT/BIOS 543 or ECON 501. Study of multivariate statistical methods frequently used in business and analytics problems including principal components, factor analysis, discriminant analysis, MANOVA, logistic regression and cluster analysis. The focus is on applying these techniques through the use of a computer package.

SCMA 645. Management Science. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543, SCMA 301, SCMA 524, STAT 541 or STAT 543. Examines the formulation, analysis and solution of quantitative models for business problems. Problems addressed include the allocation of resources, making decisions and dealing with uncertainty. Applications relevant in diverse business disciplines will be investigated, and the models may include linear programming, simulation and other management science tools. Current computer solution methods will be utilized.

SCMA 646. Legal Foundations of Employment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SCMA 530 or MGMT 637. Examines the laws concerning human resources in organizations. Equal Employment Opportunity, wage and hours laws, Equal Pay Act, the Employee Retirement Income Security Act, the Occupational Safety and Health Act and employee personal rights laws are emphasized.

SCMA 648. Analytics for Organizational Decision-making. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543, SCMA 302, SCMA 524, STAT 541 or STAT 543. Analytical procedures and techniques used by organizations in reaching decisions based on data and application area knowledge. The emphasis is on the application of data-driven decision approaches to solving problems in contemporary organizations using business-oriented computational software.

SCMA 669. Developing and Implementing Forecasting Methods for Business. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543, ECON 501, SCMA 302, SCMA 524, STAT 541 or STAT 543. Forecasting methods and applications appropriate for managerial decision-making. Methods covered include moving average and exponential smoothing, seasonal adjustments, time series, forecast averaging, new-product forecasting, and combining managerial judgment and analytical forecasts. Particular emphasis is placed on developing and implementing forecasting techniques and other analytical tools in an interactive organization and appreciation of issues and caveats associated with each technique. Course includes data acquisition and teamwork along with effective consulting, communication and presentation skills.

SCMA 675. Operations Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite:BIOS 543, SCMA 301, SCMA 524, STAT 541 or STAT 543. A systematic investigation of the concepts and issues in designing, operating and controlling productive systems in both manufacturing and services.

SCMA 677. Quality Management and Six Sigma. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543, SCMA 302, SCMA 524, STAT 541 or STAT 543. Concepts of quality management and Six Sigma: quality strategies, organizational quality assessment, Six Sigma process management tools and techniques, process control and improvement tools, the voice of the customer and the voice of the employee.

SCMA 690. Research Seminar in Supply Chain Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Approval of proposed work is required by graduate studies office in the School of Business. This course is designed to provide research experience for candidates pursuing a non-thesis option.

SCMA 691. Topics in Supply Chain Management and Analytics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Study of current topics. Topics may vary from semester to semester.

SCMA 693. Field Project in Supply Chain Management and Analytics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Students will work under the supervision of a faculty adviser in planning and carrying out a community-engaged research project. A written report of the investigations is required.

SCMA 697. Guided Study in Supply Chain Management. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Prerequisite: Approval of proposed work is required by graduate studies office in the School of Business. Graduate students will submit a detailed outline of their research problem. They will be assigned reading and will prepare a written report on the problem. To be taken at the end of the program.

School of Dentistry

Dental Biomedical Sciences (DEBS)

DEBS 501. Dental Gross Anatomy. 6.5 Hours.
Semester course; 4 lecture and 3 laboratory hours. 6.5 credits. A systematic dissection and study of the human body with clinical correlation and emphasis on the head and neck.

DEBS 502. Dental Neuroanatomy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Through this course, students will develop broad-level knowledge of neuroanatomical structures and principles and the role of the nervous system. Dental clinical correlations will be used to illustrate the future clinical necessity for and application of this scientific background.

DEBS 503. Infection and Immunology. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Enrollment restricted to dental students in the first professional year; others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry.

DEBS 511. Microscopic Anatomy. 5 Hours.
Semester course; 2.5 lecture and 5.5 laboratory hours. 5 credits. A study of the normal tissues and organs of the human body at the microscopic level, with emphasis on the histological organization and development of the oral cavity.

DEBS 512. Physiology and Pathophysiology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. A comprehensive study of the function of mammalian organ systems, designed primarily for dental students.

DEBS 513. Dental General Pathology. 6 Hours.
Semester course; 3 lecture and 6 laboratory hours. 6 credits. Instruction in the basic principles regarding alteration of structure and function in disease and in the pathogenesis and effect of disease in the various organ systems.

DEBS 601. Dental Pharmacology and Pain Control I. 4 Hours.
Yearlong course; 4 lecture hours. 4 credits. This course covers the study of the effects of chemical agents on the structure and function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes. Students receive CO grading in the fall and letter grade and earned credit in the spring.

DEBS 701. Dental Pharmacology and Pain Control II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: DEBS 601. The study of the effects of chemical agents on the structure and/or function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes.

DEBS 702. Dental Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is restricted to students in the D.D.S. program. Topics in human genetics with application to clinical dentistry.

Dental Special Topics (DENS)

DENS 503. Introduction to Behavioral Science in Dentistry. 1 Hour.
Semester course; 16 didactic hours. 1 credit. Prerequisite: enrollment within a School of Dentistry degree program. Course consists of online lectures, discussion board activities, assigned readings and interactive activities centering on understanding health disparities and access to care issues as they relate to patient-centered care among diverse populations. Graded as pass/fail.

DENS 508. Dental Materials I. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This is the first in a series of four courses that provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on those materials used in operative dentistry. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 513. Foundations of Effective Interpersonal Skills During Patient Interactions I. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Enrollment restricted to students in a School of Dentistry degree program. Course consists of online and face-to-face lectures, skill-building activities, student role-plays and a standardized patient assessment. Students will work both individually and in small groups for discussion and role-plays utilizing foundational motivational interviewing techniques. Graded as Pass/Fail.

DENS 515. Clinical Skills I. 1 Hour.
Semester course. 1 credit. Provides didactic information and practice opportunities to familiarize first-year dental students with patient management and selected clinical skills. The course runs concurrently with courses in periodontics and operative dentistry to provide the basis for initial entry into the dental clinic and patient care.

DENS 516. Clinical Skills II. 3.5 Hours.
4 laboratory and 15 clinical hours. 3.5 credits. Prerequisite: DENS 515. The second in a four-part series of courses designed to prepare dental students for entry into the clinical training environment. Students' learning experiences include didactic lectures, clinical practice and observation, and simple patient-based interactions and/or procedures performed while assisting more senior dental students. Enrollment is restricted to admitted dental students.

DENS 524. Evidence-based Dentistry and Critical Thinking I. 1 Hour.
1 credit. The fundamentals of evidence-based dentistry will be taught. Students will gain the ability to identify, retrieve and critically appraise dental literature.

DENS 550. Update in Practice Administration. 1 Hour.
Semester course; 15 seminar hours. 1 credit. Lectures and seminar discussion on the business aspects of contemporary specialty dental practice, with emphasis on entry into practice, associateship contracts, financing arrangements, risk management and employee relations.

DENS 580. Biostatistics and Research Design in Dentistry. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken for two consecutive semesters. Provides the advanced education student in dentistry an appreciation for the need for and uses of fundamental biostatistical methods in dental applications. Appropriate research designs for answering research questions of importance in dentistry will be examined. An array of biostatistical methods that are commonly used in the dental literature and by agencies such as the FDA to evaluate new dental products and methodologies are discussed.

DENS 603. Foundations of Effective Interpersonal Skills During Patient Interactions II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. Prerequisite: DENS 513. The two-semester course consists of online and face-to-face lectures, skill-building activities, student role-plays and a standardized patient assessment (spring). Students will work both individually and in small groups for discussion and role-plays of cases utilizing foundational motivational interviewing techniques. Students receive CO grading in the fall semester and a Pass/Fail grade upon completion.

DENS 604. Selective Special Topics in Oral Research I. 0.5 Hours.
Semester course; 0.5 lecture hours. 0.5 credits. Open to any dental student with a minimum GPA of 3.0 and in good academic standing. This introductory course will introduce students to the basics of research and innovation. Lectures will provide a framework for students to pose a research question, formulate a methodology and conduct experiments. Assignments will introduce students to analyzing and presenting research. Students will also learn the fundamentals of innovation protection. Graded as pass/fail.

DENS 605. Selective Special Topics in Oral Research II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: DENS 604 or permission of instructor. Enrollment restricted to dental students with a minimum GPA of 3.0 and in good academic standing. Students will be introduced to writing a fellowship proposal. Lectures and workshops will guide students through the process of applying for an AD Williams fellowship. Students will also begin their independent research. Graded as pass/fail.

DENS 606. Selective Special Topics in Oral Research III. 0.5-2 Hours.
Semester course; variable hours (3 research hours per credit). 0.5-2 credits. May be repeated for a maximum total of 16 credits. Prerequisite: DENS 605 or permission of instructor. Enrollment restricted to dental students with a minimum GPA of 3.0 and in good academic standing. Independent study and individual research experiences will be conducted under the guidance of a research mentor. Graded as pass/fail.

DENS 608. Dental Materials II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. The second in a series of four courses. These courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on those materials used in prosthodontic dentistry. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 611. Introduction to Professionalism, Ethics and Ethical Decision-making. 1 Hour.
Semester course. 1 credit. Provides a review of the foundation of ethical principles, concepts of professionalism, professional student behavior and responsibilities, ethical issues guiding dentistry, and the development of an ethical decision-making model.

DENS 619. Evidence-based Dentistry and Critical Thinking II. 1 Hour.
1 credit. The fundamentals of evidence-based dentistry will be taught. Students will gain the ability to identify, retrieve and critically appraise dental literature.

DENS 621. Dental Occlusion. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Consists of lectures which expand on the basic concepts that were presented in the fundamentals of occlusion course. Focuses on the examination, diagnosis and treatment planning of various occlusal problems. The student will learn the skills needed to analyze the dental occlusion of patients and to plan successful occlusal therapy, including restorative procedures and fixed prosthodontics treatment.

DENS 622. Dental Occlusion Lab. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Consists of labs which expand on the basic concepts that were presented in the fundamentals of occlusion course. Focuses on the examination, diagnosis and treatment planning of various occlusal problems. The student will learn the skills needed to analyze the dental occlusion of patients and to plan successful occlusal therapy, including restorative procedures and fixed prosthodontics treatment. Graded as pass/fail.

DENS 623. Clinical Skills IV. 7 Hours.
Semester course; lecture and clinic contact hours. 7 credits. Fourth in the clinical skills series, this course is designed to develop students' familiarity with and confidence in the clinical setting prior to beginning clinical care of their own patient pool. Students will have the opportunity to assist more senior students within their practice group and to perform simple operative procedures.

DENS 625. Clinical Skills III. 5 Hours.
Semester course; lecture and clinic contact hours. 5 credits. Designed to evaluate the student's ability to perform specific clinical skills and to provide a variety of experiences to prepare for entry to the school's student clinical practice. Case-based, problem-oriented histories will provide the foundation for development of phased treatment plans and a series of mannequin exercises. Students will have simulated and patient-based experiences during assigned rotations in the school's patient care clinics. Experiences are provided to enhance the student's communication skills as an oral health professional functioning as a component of a health care team. Rotations are coordinated with the spring clinical skills IV course.

DENS 628. Evidence-based Patient Care I. 1 Hour.
1 credit. Students will learn to apply the fundamentals of evidence-based dentistry to practical application in patient care.

DENS 630. Orthodontic-Periodontic-AEGD Conference. 0.5 Hours.
Semester course; 8 seminar hours. 1 credit. Must be taken every semester of the program. Discusses treatment planning and analysis of patients requiring combined orthodontic, periodontic and restorative care. Presents topics of interest to orthodontists, periodontists and general dentists. Graded S/U/F.

DENS 642. Fundamentals of Treatment Planning. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open only to second-year D.D.S. students. Designed to build upon the student's prior exposure to discipline-based treatment planning concepts. Students will develop an integrated, multidisciplinary approach to urgent and oral disease control phase patient treatment planning. The course will also cover the use of information technology applications to document treatment plans and strategies for effectively communicating treatment plans to patients. Graded P/F.

DENS 651. Preclinical General Practice Dentistry Lab. 5 Hours.
Semester course; 200 laboratory hours. 5 credits. Admission into VCU International Dentist Program required. Designed to prepare and transition a class of internationally trained dentists into the third year of dental school at VCU. All aspects of preclinical dentistry will be covered in this basic preparatory laboratory course. Graded P/F.

DENS 652. Preclinical General Practice Dentistry Lecture. 9 Hours.
Semester course; 144 lecture hours. 9 credits. Admission into VCU International Dentist Program required. Designed to prepare and transition a class of internationally trained dentists into the third year of dental school at VCU. All aspects of preclinical dentistry will be covered in this basic preparatory lecture course. Graded P/F.

DENS 653. Clinical General Practice Dentistry Lecture. 6 Hours.
Semester course; 96 lecture hours. 6 credits. Admission into VCU International Dentist Program required. Comprises clinical experiences prior to the third year of professional study. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists. Specialty subjects and techniques will be combined to form a general dentistry model for patient care. Guidance from faculty will encourage the student to synthesize and integrate materials, methods and techniques from previous courses into a logical and systematic approach to the delivery of oral health care. Small-group seminars will be provided to enhance the student's transition to dental health care at VCU. Graded P/F.

DENS 654. Clinical General Practice Dentistry Lab. 5 Hours.
Semester course; 200 laboratory hours. 5 credits. Enrollment requires admission into the VCU International Dentist Program. Prerequisite: DENS 652. Comprises clinical experiences prior to the third year of professional study. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists. Specialty subjects and techniques will be combined to form a general dentistry model for patient care. Guidance from faculty will encourage the student to synthesize and integrate materials, methods and techniques from previous courses into a logical and systematic approach to the delivery of oral health care. Small-group seminars will be provided to enhance the student's transition to dental health care at VCU. Graded pass/fail.

DENS 655. Preclinical General Practice Dentistry for Internationally Trained Dentists. 6 Hours.
Yearlong course; 6 lecture hours. 6 credits. Designed to support the integration of a class of internationally trained dentists into the second year at the VCU School of Dentistry, this course addresses special topics of concern for this cohort. The course will cover core didactic material and laboratory activities and will strengthen areas that have been previously identified as opportunities for growth in this student population. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

DENS 660. Interdisciplinary Care Conference. 0.5 Hours.
Continuing course; 7 hours. 1 credit. Must be taken every year of the program. Provides a forum for formal presentation and group discussion of the diagnosis, treatment planning, delivery and prognosis of interdisciplinary dental care. Designed for continuing enrollment for two academic semesters; graded CO in the fall and a final grade of Pass or Fail in the spring.

DENS 699. Thesis Guidance. 1-2 Hours.
Semester course; 18-36 seminar hours. 1-2 credits. Must be taken every semester of the program. The graduate student selects a research project topic, conducts the necessary background literature review, develops a protocol, obtains the necessary materials, instruments and human/animal use approvals as necessary, collects and analyzes the data, presents the findings in the form of a master's thesis, and prepares a manuscript for publication.

DENS 700. Basic Sciences and Graduate Dentistry. 3 Hours.
First year; spring course; 45 hours. 3 credits. Advanced level survey of topic areas related to the principles and practices of dentistry including: oral pathology, biochemistry and physiology, infection and immunity, pharmacology, biomaterials and genetics.

DENS 701. Remediation in Dentistry. 1-7 Hours.
Semester course; variable contact hours. Variable credits. This course is not part of the core D.D.S. curriculum. Students who must remediate a course, for any reason, will be enrolled in this course during their remediation period and credit hours will be assigned consistent with the course being remediated. A grade of pass/fail will be assigned at the completion of the remediation period.

DENS 702. Dental Clinics. 1-12 Hours.
Semester course; variable hours, clinical contact. 1-12 credits. May be repeated for credits. Restricted to students enrolled in D.D.S. program. This course is designed for students who need to remediate clinical experiences, make up clinical experiences or are off cycle with clinical work for any other reason. Credit hours, learning objectives and exact expectations/responsibilities will be identified in an individualized education plan for each student as determined by the school's deans for clinical education and academic affairs. Graded pass/fail.

DENS 703. Advanced Interpersonal Communications I. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. Enrollment restricted to students in a School of Dentistry degree program. This is a two-semester course which introduces third-year dental students to goal setting/change plans and advanced motivational interviewing techniques. The course consists of online and face-to-face lectures, skill-building activities, student role-plays and a patient assessment (spring). Students receive CO grading in the fall semester and a Pass/Fail grade upon completion.

DENS 704. Academic Dental Career Exploration Elective. 1 Hour.
Semester course; 3 laboratory hours. 1 credit. Exact contact hours will vary by student and their self-designed learning plan. Enrollment restricted to students in the D.D.S. program with permission of the course director. This is an elective course for D2, D3 or D4 dental students who are interested in learning more about academic dental teaching and/or research careers. The course matches each student with a faculty mentor who provides insight into the day-to-day life of an educator or researcher. This elective is modeled on the ADEA Academic Dental Careers Fellowship Program. Graded as Pass/Fail.

DENS 708. Dental Materials III. 0.5 Hours.
Yearlong course; 0.5 lecture hours. 0.5 credits. The third in a series of four courses. These courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of 1) the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on applying dental materials knowledge to clinical practice. Student-led seminars will be adopted, wherein students will be divided into groups and a specific topic will be assigned to each group. These kinds of seminars will improve the students in terms of critical-thinking, working in teams and presentation skills. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 713. Advanced Interpersonal Communications II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. Enrollment restricted to students in a School of Dentistry degree program. This is a two-semester course for fourth-year dental students to integrate behavioral science content, advanced motivational interviewing techniques and emotional intelligence skills into professional practice. The course consists of online and face-to-face lectures, skill-building activities, student role-plays and a patient assessment (fall). Students receive CO grading in the fall semester and a Pass/Fail grade upon completion.

DENS 718. Dental Materials IV. 0.5 Hours.
Yearlong course; 0.5 lecture hours. 0.5 credits. The fourth in a series of four courses. These courses provide the scientific foundations for understanding the factors guiding the use of biomaterials in dentistry. The main objectives of this course are to provide the student with knowledge of the general nature and composition of dental materials; the relationship of dental materials with the oral structures; the physical, mechanical, chemical, biological and aesthetic properties of dental materials; and indications for and proper use of dental materials. Special emphasis will be on applying dental materials knowledge to clinical practice and helping students to make independent decisions on materials choice in clinical dentistry, thus preparing them for life after dental school. Graded as CO in the fall semester with a letter grade and credit awarded in spring.

DENS 730. Dental Practice Management III. 1 Hour.
Semester course; 1 credit. The third in a series of four courses required over the duration of the four-year DDS curriculum. The series will prepare the dental graduate for making decisions about the type of practice to pursue, planning to establish or purchase a practice and, ultimately, managing it once in operation. Topics covered are those appropriate to the third-year dental student and may include, but are not limited to, marketing a practice, selecting the right location, ergonomics and managing the dental office. Graded as P/F.

DENS 735. Patient Management and Professional Conduct. 2.5 Hours.
Semester course; clinical contact hours. 2.5 credits. May be repeated for credit. Designed for third-year dental students to understand and practice the concepts of ethical conduct, patient management, risk management and professional responsibility. This course is based upon the application of the VCU School of Dentistry Code of Professional Conduct, the ADA Principles of Ethics and Code of Professional Conduct, and the School of Dentistry's Patient Bill of Rights in the clinical setting and is designed to help the dental student strive to do what is right for their patients, now and into the future.

DENS 740. Dental Practice Management IV. 1 Hour.
Semester course; 1 credit. The fourth in a series of four courses required over the duration of the four-year DDS curriculum. The series will prepare the dental graduate for making decisions about the type of practice to pursue, planning to establish or purchase a practice and, ultimately, managing it once in operation. Topics covered are those appropriate to the senior dental student and may include, but are not limited to, writing a business plan and understanding the current economy and its impact on dental practice. Graded as P/F.

DENS 745. Patient Management and Professional Conduct. 2.5 Hours.
Semester course; clinical contact hours. 2.5 credits. May be repeated for credit. Designed for fourth-year dental students to understand and practice the concepts of ethical conduct, patient management, risk management and professional responsibility. This course is based upon the application of the VCU School of Dentistry Code of Professional Conduct, the ADA Principles of Ethics and Code of Professional Conduct, and the School of Dentistry's Patient Bill of Rights in the clinical setting and is designed to help the dental student strive to do what is right for their patients, now and into the future.

DENS 752. Clinical General Practice Dentistry. 14.5 Hours.
Yearlong course; 7-8 clinic sessions per week. 14.5 credits. Enrollment restricted to fourth-year dental students. Course encompasses all clinical patient care instruction within the School of Dentistry group practices. This course is designed to enhance the student's clinical experience in patient management, treatment planning, utilization of dental auxiliaries, consultation with other health care professionals and referral to appropriate dental specialists.

DENS 762. Clinical Service-learning. 6 Hours.
Yearlong course; 50 clinical sessions. 6 credits. A course-based, credit-bearing educational experience in which students participate in an organized service activity that meets community-identified needs. During the course, students are assigned rotations in clinical practice settings in underserved areas. In these settings, students are exposed to patients of varied ethnic, socioeconomic and demographic backgrounds, as well as special patient populations not typically encountered in the School of Dentistry clinics. Students have the opportunity to make oral health care more accessible to marginalized groups while continuing clinical education. Throughout this unique learning experience students are exposed to the benefits of potential practice in public health dentistry. Students will reflect on the service activity to increase understanding and application of course content and to enhance a sense of civic responsibility. Course graded as CO with no credit for fall semester; P/F and credit assigned for spring semester.

DENS 780. Functional Occlusion: From TMJ to Smile Design Selective. 1.5 Hour.
Yearlong course; 1 lecture and 1 laboratory hour. 1.5 credits. Enrollment restricted to selected D4 dental students and AEGD residents. The course consists of lectures and clinic/laboratory components, which expand on the basic concepts that were presented in core D.D.S. curriculum. Students receive CO grading in the fall and Pass/Fail grade and earned credit in the spring.

DENS 790. Selective: Applications of 3D Printing in Dentistry. 1 Hour.
Semester course; 1 lecture and .5 clinic hours. 1 credit. Enrollment restricted to students admitted to D.D.S. program and selected by course faculty. The course has three components: 1) an online self-learning module on basic principles of 3D printing and its applications in biological science and health science, as well as principle and workflow for implant-guided surgery, 2) a workshop on implant treatment planning using commercially available software and 3D printing of models and surgical guide and 3) a patient-based observation experience in implant-guided surgery. The course is designed for students to use the most up-to-date digital technology to diagnose and treat real clinical cases. Graded as Pass/Fail.

Endodontics (ENDO)

ENDO 522. Introduction: Specialty of Endodontics. 2 Hours.
Semester course; 96 laboratory hours. 2 credits. Restricted to first-year students. Utilizes laboratory exercises to review basic concepts and introduce the more complex technical procedures required to practice the clinical specialty of endodontics.

ENDO 530. Advanced Oral Pathology. 1 Hour.
Semester course; 13 seminar hours. 1 credit. Provides through a series of seminars, an in-depth knowledge of those specific areas of oral pathology that apply to endodontics.

ENDO 532. Management of Medical Emergencies in the Dental Office. 1 Hour.
Semester course; 20 seminar hours. 1 credit. Provides through a series of seminars, an in-depth level of knowledge in the management of medical emergencies in the dental office.

ENDO 560. Endodontic Therapy Lectures. 3.5 Hours.
Semester course; 58 lecture hours. 3.5 credits. Restricted to first-year students. Presents a series of lectures on clinical endodontic topics in order to familiarize the students with clinical endodontic procedures either in conjunction with or prior to the "Endodontic Topic Literature Reviews" on these specific clinical topics.

ENDO 622. Principles of Endodontics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Covers the basic principles of endodontics in preparation for clinical endodontics.

ENDO 623. Principles of Endodontics Lab. 1.5 Hour.
Semester course; 4 laboratory hours. 1.5 credits. This lab course teaches the basic technical skills of endodontics in preparation for clinical endodontics.

ENDO 650. Endodontic Topic Literature Review. 3.5 Hours.
Semester course; 58 seminar hours. 3.5 credits. May be repeated for credit. Must be taken every semester of the program. Reviews topic literature pertaining to the scientific basis for endodontic procedures and the materials and techniques utilized in the clinical practice of endodontics. Discusses content of the reviewed literature and critically evaluates by means of abstracts and study questions.

ENDO 652. Endodontic Clinical Seminars. 1.5 Hour.
Semester course; 28 seminar hours. 1.5 credits. May be repeated for credit. Must be taken every semester of the program. Requires students to present a seminar once each month in which difficult diagnostic cases, patient management problems and complex treatment cases are critiqued and treatment options discussed.

ENDO 654. Endodontic Management of the Medically Compromised Patient. 1 Hour.
Semester course; 14 seminar hours. 1 credit. Must be taken for two consecutive semesters. Provides students, through a seminar series, with an in-depth level of knowledge in the endodontic management of the medically compromised patient.

ENDO 656. Endodontic Current Literature Review. 1 Hour.
Semester course; 18 seminar hours. 1 credit. Must be taken every semester of the program. Provides a review of current journal literature that pertains to the scientific basis for endodontic procedures, materials and techniques currently being used in the clinical practice of endodontics. Discusses and critically evaluates the content of the reviewed literature. Requires written abstracts of all reviewed articles.

ENDO 680. Clinical Endodontics. 1-5 Hours.
Semester course; 153 clinical sessions. Variable for 1-5 credits. Must be taking both fall and spring of the first and second years of the program for 5 credits each semester. May be taken in additional semesters as needed to complete clinical training; credit will vary based on circumstances. Permits students to receive supervised training in every type of clinical endodontic procedure. Provides students with experience in the management and treatment of cases which are the same types of complex non-surgical and surgical cases treated in a specialty practice of endodontics.

ENDO 700. Senior Selective in Advanced Clinical Endodontics. 1 Hour.
Semester course; 4 clinical hours per week. 1 credit. Prerequisites: successful completion of ENDO 622 (sections .01 and .02), ENDO 731, ENDO 739 and permission of the course director. This clinical course is designed to develop advanced skills in treating endodontic cases beyond the scope of those expected in basic clinical competency of a dental student.

ENDO 731. Endodontic Therapy. 1 Hour.
Semester course; 1 lecture contact hour. 1 credit. An application course designed for the student to gain experience and demonstrate proficiency in the application of clinical endodontic knowledge to the diagnosis and management of complex clinical endodontic problems. Emphasis is placed on differential diagnosis and management of clinical endodontic problems. This course builds on the principles of diagnosis and treatment of disease of the pulp and periradicular tissues and injuries of the dental pulp. This course continues to place emphasis on the prevention of disease and maintenance of the normal pulpodentin complex.

ENDO 739. Clinical Endodontics III. 1.5 Hour.
Yearlong clinical course. 1.5 credits. Designed to develop clinical skills and provide experience in the diagnosis, treatment planning, treatment, prognosis, follow-up care and clinical patient management in cases involving the pulp and periradicular tissues. Emphasis is placed on the management of common clinical problems that may be encountered in the general practice of dentistry. This course emphasizes and elaborates on the rationale and treatment techniques presented in the D-2 didactic and laboratory course.

ENDO 749. Clinical Endodontics IV. 1.5 Hour.
Yearlong course; 1 clinic session per week.1.5 credits. This course is designed to enhance the student's clinical experience in the field of endodontics, to include patient management, treatment planning, endodontic treatment modalities, consultation with other health care professionals and referral to appropriate dental specialists. Emphasis is placed on the management of common clinical endodontic problems that may be encountered in the general practice of dentistry. The course will run the spring and fall semester of the dental student's fourth year. Guidance from faculty will encourage the student to synthesize and integrate techniques taught in previous endodontic courses and labs into a logical and systematic approach to the delivery of quality endodontic care to the patients. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

Oral and Craniofacial Molecular Biology (OCMB)

OCMB 701. An Introduction to Oral Biology. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students enrolled in the oral health research graduate program or by permission of the instructor. An overview course on the development, structures and tissues of the head and neck. Topics include craniofacial and dental development, cancers of the head and neck, the oral microbiome, immune responses in the oral cavity, the connection between oral and systemic diseases and recent advances in bioengineering for oral disease.

OCMB 702. Oral Pathogenesis. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to students enrolled in the oral health research graduate program or by permission of the instructor. This course will provide a basic understanding of the nature of disease and current therapeutic approaches to bacterial, viral and molecular diseases of the head and neck and bone pathologies originating from development defects and/or trauma. Students will learn about the molecular causes of diseases and general approaches to understanding and treating disease.

OCMB 703. Research Topics in Oral Biology. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Restricted to students enrolled in the oral health research graduate program or by permission of instructor. This course will provide an in-depth discussion of current research in head and neck diseases. Students will be expected to critically evaluate relevant literature, discuss approaches to solving research topics and begin to identify possible areas of research for their dissertation. Graded as Pass/Fail.

OCMB 704. Oral Biology Seminar Series. 1 Hour.
Semester course; 1 seminar hour. 1 credit. This course will consist of a series of seminars by invited speakers addressing research topics in selected areas of oral health research and a series of student-led journal clubs. Graded P/F.

OCMB 705. Oral Biology Oral Biology Directed Research. 1-15 Hours.
Semester course; 1-15 laboratory research hours. 1-15 credits. Restricted to students enrolled in the oral health research graduate program or by permission of the instructor. This course will provide practical laboratory experience in participating laboratories. Graded Satisfactory/Unsatisfactory/Fail.

OCMB 706. Proposal Preparation. 1 Hour.
Semester course; tutorials and lectures. 1 credit. Restricted to students enrolled in the oral biology graduate program or by permission of the instructor. This course will provide students with the opportunity to draft an NIH application. Graded P/F.

OCMB 707. Research Skills and Career Development. 1 Hour.
Semester course; tutorials and workshops. 1 credit. Restricted to students enrolled in the oral health research graduate program or by permission of the instructor. This course will provide students with the opportunity to develop skills required to conduct and communicate their research, including assessing literature and managing databases, poster and oral presentations, finding research funding, preparing for writing the thesis, and exploring career opportunities outside academia. Students receive CO grading throughout enrollment with a pass/fail grade and credit earned during the final semester.

Orthodontics (ORTH)

ORTH 532. Biomechanics: Theoretical Basis for Tooth Movement. 1 Hour.
Semester course; 15 lecture/seminar hours. 1 credit. Introduces physical science of mechanics and engineering statics as applied to orthodontic force systems. Emphasizes equilibrium and the biological manifestation of force systems applied to the dentition and craniofacial skeleton.

ORTH 620. Orthodontic Clinic for Non-orthodontic Graduate Students. 1 Hour.
Semester course; 30 clinical sessions. 1 credit. Must be taken every semester of the program. Allows residents to diagnose and treat limited orthodontic problems with special emphasis on the primary and mixed dentitions. Includes, but is not limited to, anterior and posterior crossbites, space and tooth loss, transient or definitive crowding and tooth irregularities, oral habits, ectopic and other tooth eruption problems.

ORTH 623. Orthodontics Lecture. 2 Hours.
Semester course; 2 lecture contact hours. 2 credits. An introduction to orthodontics meant to provide second-year dental students with a basic understanding of the diagnosis and treatment of orthodontic problems. The emphasis will be on understanding basic, universally applicable orthodontic concepts rather than on learning specific details relating to particular treatment mechanisms or appliances. This is consistent with current trends in the specialty, which recognize that orthodontic solutions are often attainable by many routes, with a common goal of maximizing the functional, esthetic and stable end result. There will be an overview of growth and development, emphasizing how favorable or unfavorable growth may influence orthodontic diagnosis and treatment. A detailed description of the development of occlusion will also be presented with an emphasis on recognizing and diagnosing abnormalities related to tooth eruption and craniofacial growth.

ORTH 650. Literature Review. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Reviews classical articles in areas of special orthodontic interest. Establishes the state-of-the-art and existing information base. Gives special attention to research methodology and conclusions reached.

ORTH 652. Growth and Development. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Discusses the increases in size and complexity that occur in the craniofacial region including variations in proportionality and related variations in facial form and dental occlusion. Provides special emphasis on compensations in skeletal and soft tissue structures. Examines the basis for prediction of change.

ORTH 654. Orthodontic Diagnosis and Treatment Planning. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Considers and discusses available and theoretical options for clinical management of variations in facial form and dental occlusion.

ORTH 656. Current Literature. 2 Hours.
Semester course; 30 seminar hours. 2 credits. Must be taken every semester of the program. Presents in a journal-club-format evaluation of current information in orthodontics and related disciplines. Includes special emphasis on research methodology and the contributions of current research to advances in orthodontics.

ORTH 658. Analysis of Orthodontic Treatment. 1.5 Hour.
Semester course; 22.5 seminar hours. 1.5 credits. Must be taken every semester of the program. Analyzes cephalometric and other objective measures of the outcomes of orthodontic therapy. Reviews treatment objectives with respect to actual changes effected in patients. Delineates changes resulting from therapy from normal variations in craniofacial development.

ORTH 660. Orthognathic Conference. 1 Hour.
Semester course; 15 seminar hours. 1 credit. Must be taken every semester of the program. Presents patients requiring coordinated orthodontic and oral surgery care. Emphasizes long- and short-term biologic stability of alterations in the structure and function of the craniofacial skeleton with increased emphasis on facial form and dental occlusion.

ORTH 662. Craniofacial Anomalies. 1 Hour.
Semester course; 15 lecture/seminar hours. 1 credit. Must be taken every semester of the program. Discusses the etiology and embryologic basis of congenital and acquired deformities in the craniofacial structures. Emphasizes syndromes with craniofacial manifestations and the diagnosis and treatment planning for patients with facial clefts.

ORTH 680. Orthodontic Clinic. 1-6.5 Hours.
Semester course; 195 clinic sessions. Variable for 1-6.5 credits. Must be taking both fall and spring of the first and second years of the program for 6.5 credits each semester. May be taken in additional semesters as needed to complete clinical training; credit will vary based on circumstances. Involves supervised experiences in treatment of a complete spectrum of normally occurring orthodontic problems in an environment simulating private practice. Graded P/F.

ORTH 700. Senior Selective in Orthodontics. 4 Hours.
Semester course; 4 clinical and 1 seminar hours per week. 4 credits. Prerequisites: successful completion of ORTH 623, ORTH 733, ORTH 739 and permission of the course director. A clinical and didactic course designed for students who wish to gain advanced knowledge of orthodontics in an environment simulating a practice setting. The course will include participation in seminars, clinical activities and hospital rotations for craniofacial patients. The course will extend over the fall and spring semesters and will provide an excellent preparation for students entering the private practice of dentistry or students seeking graduate education in the field of orthodontics. A maximum of four students will be chosen to participate in this selective each year. Graded CO for the fall semester and P/F for the spring.

ORTH 733. Orthodontic Therapy. 1 Hour.
Semester course; 1 lecture contact hour. 1 credit. Consists of didactic lectures, a continuation of ORTH 623.

Pediatric Dentistry (PEDD)

PEDD 511. General Anesthesia Rotation. 3 Hours.
Semester course; 40 clinical sessions. 3 credits. Teaches general anesthesia with special emphasis in pediatrics. Allows students to become knowledgeable in pre-operative evaluation, risk assessment, assessing the effects of pharmacologic agents, venipuncture techniques, airway management, general anesthetic induction and intubation, administration of anesthetic agents, patient monitoring, prevention and management of anesthetic emergencies, recovery room management, postoperative appraisal and follow-up.

PEDD 512. Growth and Development. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. Lecture format provides foundational knowledge on the growth and development of the head and neck to include oral embryology and development of the dentition.

PEDD 514. Introduction to Pediatric Dentistry. 2 Hours.
Semester course; 30 lecture hours. 2 credits. Introduces material in pediatric dentistry. Involves didactic, clinical and laboratory portions.

PEDD 572. Pediatric Dental Emergency Service. 2.5 Hours.
Semester course; 30 clinical sessions. 2.5 credits. Must be taken for two consecutive semesters. Graduate students are scheduled for emergency services on a weekly basis. Offers experience in the assessment and management of orofacial trauma, dental pain and infections.

PEDD 612. Seminar Series: Pediatric Dentistry and Medicine. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Provides an arena for students to present seminars in either a clinical area or medical conditions of interest to pediatric dentists. Gives students practical experience in giving formal presentations and provides him/her with information related to clinical subject area(s) with medical conditions about which pediatric dentists should be knowledgeable.

PEDD 620. Pediatric Medicine Rotation. 1.5 Hour.
Semester course; 40 clinical sessions. 1.5 credits. Requires students to obtain and evaluate medical histories, parental interviews, system-oriented physical examinations, clinical assessments of healthy and ill patients, selection of laboratory tests and evaluation of data, evaluation of physical, motor and sensory development, genetic implications of childhood diseases, the use of drug therapy in the management of diseases and parental management through discussions and explanations.

PEDD 640. Clinical Teaching. 2 Hours.
Semester course; 25 clinical sessions. 2 credits. May be repeated for credit. Must be taken every semester of the program. Lectures and clinical instruction involving contact with third and forth-year dental students. Provides teaching experience in diagnosis and treatment planning, restorative preparations and management of children's behavior.

PEDD 650. Literature Review. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken every semester of the program. Reviews literature related to all aspects of the pediatric patient. Emphasizes the ability students to discuss the content of the articles and to critically evaluate it. Stresses the integration of new material with previously discussed literature and collateral material. Uses the reading list from the American Board of Pediatric Dentistry.

PEDD 654. Treatment Planning Seminar. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. May be repeated for a total of four credits. Must be taken every semester of the program. Provides diagnosis and treatment planning of the child, adolescent and special patient. Follows up on records on completed cases, which also are presented and evaluated. Discusses the techniques employed and the justification of the treatment.

PEDD 656. Current Literature Review. 1 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. May be repeated for credit. Discusses articles from recent publications relating to all aspects of pediatric dentistry. Covers and critically reviews the Policies and Guidelines of the American Academy of Pediatric Dentistry.

PEDD 680. Pediatric Dental Clinic. 1-4 Hours.
Semester course; 120 clinical sessions. Variable for 1-4 credits. Must be taking both fall and spring of the first and second years of the program for 4 credits each semester. May be taken in additional semesters as needed to complete clinical training; credit will vary based on circumstances. Provides for the clinical management of pediatric dental patients. Provides experiences in the treatment of infants, preschool children, adolescent and special patients. Stresses pharmacological and non-pharmacological techniques and behavior management.

PEDD 700. Senior Selective in Pediatric Dentistry. 1 Hour.
Semester course; 4 clinical hours per week. 1 credit. Prerequisites: successful completion of PEDD 611 and PEDD 733 and permission of the course director. This is a clinical course that provides students with more advanced experiences and techniques in pediatric dentistry.

PEDD 701. Selective in Special Care Dentistry. 1 Hour.
Semester course; 4 clinical hours/week. 1 credit. Prerequisites: D4 standing and selection by course faculty. This course is designed to give the interested student clinical exposure to the comprehensive dental care of individuals who have special health care needs. Graded as pass/fail.

PEDD 730. Special Care Dentistry. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to dental students with D3 standing. This course is designed to enhance the dental student's understanding of the complexities of providing care for individuals with special health care needs.

PEDD 733. Advanced Pediatric Dentistry. 1 Hour.
Semester course; 1 lecture contact hour. 1 credit. Designed to supplement and reinforce the student's knowledge of diagnosis, treatment planning and basic skills for management of the pediatric dental patient. This includes a review of basic pediatric clinical procedures and introduction to the treatment of pediatric patients with special needs.

PEDD 739. Clinical Pediatric Dentistry III. 1 Hour.
Yearlong course; 48 clinical hours. 1 credit. Clinical rotation course designed to introduce the student to the basics of clinical pediatric dentistry and to prepare the student for PEDD 749. Students receive CO grading in the fall semester and a letter grade upon completion.

PEDD 749. Clinical Pediatric Dentistry IV. 0.5 Hours.
Semester course; 29 clinical hours. 0.5 credits. Prerequisites: successful completion of all prior courses in pediatric dentistry and D4 class standing. This course is offered as a one-week clinical rotation during the senior year of the dental curriculum. Students will build upon and refine the skills developed during the D3 clinical experience. Pediatric dentistry is a unique experience because of the young patient population and psychological skills are centrally important to delivering patient care. The course has a strong emphasis on developing behavioral, communication and patient-management skills.

Periodontics (PERI)

PERI 508. Physical Diagnosis. 2 Hours.
Semester course; 30 lecture hours. 2 credits. Provides lectures and hands on experience in physical diagnosis, history taking, general physical examination and review of major organ systems.

PERI 511. Anesthesiology Rotation. 1.5 Hour.
Semester course; 45 clinical sessions. 1.5 credits. Provides students with experience in general anesthesia under the direction of the dental anesthesiologist. Emphasizes operating room procedures, airway management, intravenous technique, anesthetics and resuscitative procedures. Includes clinical management of conscious sedation cases.

PERI 512. Conscious Sedation. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Reviews concepts of parental conscious sedation techniques to include anatomy and physiology of the respiratory, cardiovascular and central nervous system, drug pharmacology, intravenous technique, prevention, recognition and management of complications, management of emergencies, physiologic monitoring and equipment, basic life support and advanced cardiac life support.

PERI 514. Introduction to Periodontics. 3 Hours.
Semester course; 48 lecture/seminar hours. 3 credits. Provides students with an introduction to the clinical practice of periodontics. Emphasizes diagnosis, etiology, prognosis, treatment planning, initial therapy, therapeutic approaches, suturing techniques, oral hygiene and dental photography.

PERI 515. Internal Medicine Rotation. 1.5 Hour.
Semester course; 45 clinic sessions. 1.5 credits. Provides students with experience in internal medicine under the direct supervision of the Department of Internal Medicine. Emphasizes hospital procedures and management of the medically-compromised patient.

PERI 520. Principles of Periodontics. 2 Hours.
Semester course; 30 lecture/seminar hours. 2 credits. Must be taken for two consecutive semesters. Reviews the principles of the basic science of periodontology, including anatomy of the periodontium, classification, etiology, diagnosis, scaling and root planning, and treatment planning. Reviews the indications and contraindications for management of complex periodontal problems. Reviews the principles of non-surgical and surgical techniques.

PERI 525. Diagnosis of Periodontal Diseases. 1 Hour.
The first in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will develop a fundamental understanding of how to assess patients for periodontal disease and how to develop a specific diagnosis. Enrollment is restricted to admitted dental students.

PERI 526. Etiology and Pathogenesis of Periodontal Diseases. 1.5 Hour.
1.5 credits. The second in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will build upon their knowledge of diagnosis and develop their understanding of the causes, mechanisms and development of periodontal disease. Enrollment is restricted to admitted dental students.

PERI 552. Implantology. 1,2 Hour.
Semester course; 16 lecture/seminar hours. 1 credit. Covers the historical review of dental implants, including biologic principles, techniques and systems; diagnosis, interdisciplinary considerations, treatment planning and indications and contraindications for implants; wound healing for implants, including osseointegration, surgical techniques and implant maintenance. Provides a hands-on technique laboratory.

PERI 619. Clinical Pathology Rotation. 0.5 Hours.
Semester course; 21 clinic sessions. 0.5 credit. Provides instruction in patient assessment, biopsy technique, assessment of tissue preparations and review of oral histologic slide materials.

PERI 627. Non-Surgical Periodontal Therapy. 1.5 Hour.
The third in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will add to their skill set a conceptual knowledge of non-surgical treatment options for periodontal disease. Enrollment is restricted to admitted dental students.

PERI 630. Medicine: Oral Medicine Seminar. 1.5 Hour.
Semester course; 26 seminar hours. 1.5 credits May be repeated for credit. Must be taken every semester of the program. Emphasizes diagnosis, pathogenesis, oral manifestations and management of systemic diseases. Reviews the management of the medically-compromised patient, including laboratory procedures, pharmacology, hematology and reviews of the cardiovascular, respiratory, endocrine and neurologic systems. Discusses and critically evaluates medical and oral medicine topics relative to management of the periodontal patient.

PERI 650. Periodontal Literature Review. 3 Hours.
Semester course; 48 seminar hours. 3 credits. Must be taken every semester of the program. Reviews the periodontal literature from early classic articles to current publications pertaining to the scientific basis for periodontal procedures. Reviews the concepts of diagnosis, etiology, epidemiology, pathogenesis, therapy, maintenance of periodontal diseases and implantology. Discusses content of the literature by means of abstracts and study questions.

PERI 654. Treatment Plan: Case Presentations. 1 Hour.
Semester course; 12 seminar hours. 1 credit. Must be taken every semester of the program. Emphasizes the interpretation the medical and dental histories, radiographic and clinical findings, diagnosis, etiology, prognosis, treatment planning, therapy and supportive periodontal care. Discusses the content of reviewed cases by written and oral presentations. Requires the student to assimilate and interpret clinical findings.

PERI 656. Current Literature Review. 3 Hours.
Semester course; 36 seminar hours. 3 credits. May be repeated for credit. Must be taken every semester of the program. Provides an in-depth review of contemporary periodontal literature. Discusses content of the reviewed literature by means of abstracts and discussion.

PERI 680. Clinical Periodontics. 1-5 Hours.
Semester course; 160 clinic sessions. Variable for 1-5 credits. Must be taking both fall and spring of the first, second and third years of the program for 5 credits each semester. May be taken in additional semesters as needed to complete clinical training; credit will vary based on circumstances. Provides supervised training in periodontics. Provides the student with the experience in the treatment and management of patients with various types and severities of periodontal diseases. Emphasizes diagnosis, treatment planning, prognosis, scaling and root planning, non-surgical and surgical techniques. Provides experience in the treatment of advanced periodontal cases and more complex surgical techniques including preprosthetic, orthodontic, periodontal plastic and mucogingival procedures, guided tissue regeneration, guided bone regeneration and implant surgical techniques. Graded P/F.

PERI 700. Advanced Periodontal Selective. 1.5 Hour.
Yearlong course; 15 seminar and 25 clinical hours. 1.5 credits. Prerequisites: successful completion of all prior courses in periodontics and permission of the course director. This course is offered to dental students who demonstrate high academic achievement and are interested in expanding their practical knowledge and experience in periodontal surgical procedures. It is designed to enhance the general dentist's knowledge regarding indications, diagnosis and treatment planning of periodontal surgical procedures and to provide hands-on experience in applying techniques of surgical periodontal procedures suitable for judicious use in general dental practice. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

PERI 719. Specialty Practice Management. 0.5 Hours.
Semester course; 22 seminar hours. 0.5 credit. Must be taken for two consecutive semesters. Provides the student with experience in office management. Requires visits to specialty offices to familiarize the student with contemporary modes of practice administration and patient management.

PERI 733. Surgical Periodontal Therapy. 1 Hour.
1 credit. The fourth in a four-part series of didactic courses designed to prepare the dental student for the clinical diagnosis and management of periodontal diseases. Through this course, students will complete their didactic exploration of periodontal diseases with a conceptual knowledge of surgical treatment options for periodontal diseases. Enrollment is restricted to admitted dental students.

PERI 739. Clinical Periodontics III. 5 Hours.
Yearlong course; clinical contact hours. 5 credits. The primary objective of the department is to provide an educational experience that will enable the dental student to meet the periodontal needs of present and future patients. These objectives necessitate student awareness of the biology of the periodontium and pathology of gingival and periodontal diseases; the ability to examine, diagnose and develop a treatment plan for the patient with significant periodontal disease; and an understanding of the implications of periodontal diagnosis and treatment on the oral and general health of the patient. The student should also be competent in plaque control, scaling, root planing and other procedures ordinarily included in presurgical phases of therapy. The student should be familiar with the entire scope of periodontal therapy, understanding the rationale and indications for surgical treatment and anticipated results.

PERI 749. Clinical Periodontics IV. 1 Hour.
Yearlong course; 1 clinic session per week. 1 credit. This final clinical course in periodontics provides competency assessment of the dental student as an entry-level dentist in the diagnosis and management of patients with periodontal diseases. Students receive CO grading in the fall and a pass or fail grade and earned credit in the spring.

School of Education

Administration and Supervision (ADMS)

ADMS 500. Workshops in Education. 1-3 Hours.
Semester course; 1-3 credits, repeatable for maximum of six credits. Designed to focus on a single topic within a curriculum area, the workshop offers graduate students exposure to new information strategies and materials in the context of a flexible instructional framework. Activities emphasize a hands-on approach with direct application to the educational setting.

ADMS 600. Public School Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of the theory and practice of public school administration. Emphasis on the governance of education and leadership roles of school boards, superintendents, principals and supervisors. Leadership theories and characteristics of effective management systems related to student discipline and academic performance, school safety, internal and external communications, and coordination with outside agencies. Appropriate field-based project relating theory to practice will be required.

ADMS 601. Processes of Instructional Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines processes of instructional leadership in schools. Primary focus on developing school leadership skills necessary to provide a positive working environment through collaboration and team-building, as well as professional opportunities including supervision and evaluation of instruction. Focus will be on best practices that lead to school cultures that build communities of learning. Appropriate field-based project relating theory to practice will be required.

ADMS 602. Seminar in Elementary School Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Problems and issues in elementary school leadership. Major responsibilities of the elementary school principal. Enrollment limited to specialists in administration.

ADMS 603. Seminar in Secondary School Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Problems and issues in secondary school leadership. Major responsibilities of the secondary school principal. Enrollment limited to specialists in administration.

ADMS 605. Organizational Theory, Structure and Culture in Educational Settings. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of organizational theory, structure and culture relating to schools. Emphasis on conceptual understandings needed for practical implementation.

ADMS 606. Organizational Behavior and Change in Educational Settings. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of organizational concepts and practices in educational contexts. Emphasis on both conceptual understandings and specific professional skills relating to diagnosis and development.

ADMS 607. Principles of Educational Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Develop understandings for school leaders of effective leadership in organizations, personal leadership styles and modifying leadership styles. Leadership with respect to vision building, organizational communications, motivating others and group problem solving will serve as major areas of study. Lecture, individual study, group work and fieldwork will serve as major means of course delivery.

ADMS 610. School and Community Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a conceptual and philosophical framework for evaluation and development of practices invovled in implementing desirable school and community relations programs that focus on unique needs of communities. Special emphasis given to skills necessary to identify significant issues, assess current practice and engage in the processes involved in building and maintaining exemplary school-community programs. Appropriate field-based project relating threory to practice will be required.

ADMS 611. School Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Legal aspects of school administration that include constitutional and statutory provisions and court decisions. Relationship of legal aspects to governance of schools in Virginia will be emphasized. Appropriate field-based project relating theory to practice will be required.

ADMS 618. Leadership for Educational Change and Improvement. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will reflect on the past, critically review current reality in schools and creatively predict the nature of schooling in the future in light of the responsive role of the school leader. Other constructs presented include change as an educational paradigm, the use of data to inform changes needed, the leader as change agent and 21st-century learning as a catalyst for 22nd-century learning. In addition, students will assess their school/organization for change readiness.

ADMS 620. Improving School Programs and Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduction to principles of leadership for the improvement of school programs and performance. Participants discuss current literature and models of school improvement with an emphasis on identification, selection and measurement of appropriate student and school performance indicators. An understanding of school culture and change, the importance of planning for change, and the role of data in the process of change are topics included. Appropriate field-based project relating theory to practice will be required.

ADMS 621. Management of School Operations and Support Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Developing understanding and practices of the school principal with respect to key elements of managing school operations and support programs. Special attention will be given to goal setting for programs, securing, organizing and managing human, material and financial resources. Attention will be given to cost/time-effective practices and accountability.

ADMS 622. Understanding Diversity and Leading for Social Justice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In this course, participants will engage in conversations related to diversity in schools and explore the critical role of education (and leadership) in a democratic society that is rapidly changing and becoming increasingly complex. Participants will reflect on how culture impacts leadership beliefs and practice and explore strategies for building schools that are equitable environments that support the needs of all stakeholders.

ADMS 623. Schooling as a Complex System. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course introduces students to a critical understanding of the politics of education through a systems thinking or systems theory perspective. After critical examination of systems thinking theory and complex systems, the remainder of the course offers an exploration of the interaction of federal, state and local governments within the complex, multilayered political structure of education.

ADMS 624. Principals as Human Resource Agents. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course examines the management of human resources in schools and school divisions. Legal issues, division policies, ethical considerations and professional interpersonal relationships are explored, along with evaluation of personnel. Students will participate in problem-solving in specific human resources cases and will critically examine human resource situations in their own contexts.

ADMS 625. Leadership for Individualized Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course represents a holistic approach to leadership for meeting needs of learners across the continuum with a focus on students with disabilities and to include gifted students and English-language learners. The constructs presented include legal and historical frameworks, equity issues, traditional and emerging policies and practices, models of instructional delivery, and roles and responsibilities of personnel.

ADMS 626. Internal/External Relations and Communications. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course provides students with the knowledge and skills essential for school leaders to relate and communicate effectively with the community in its broadest sense. Emphasis is on building relationships and communicating effectively with internal and external publics face-to-face, online and in print.

ADMS 627. Enhancing and Supporting Instruction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The focus is to learn ways to enhance and support instruction that improves student achievement. The content includes effective instruction, supervision, evaluation, professional development, diverse learners and capacity-building through the development of professional learning communities, as well as using data and curriculum alignment strategies to improve student performance.

ADMS 628. Cultural Inheritance of Schools. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course explores the engines that drive public education. Particular attention is paid to macro-level social, economic, political and demographic shifts that have transformed metropolitan school systems over the past half century. Evaluation of historical and contemporary law, policies, practices and dispositions inherent to our system of education is embedded, especially as each relates to the distribution of equal educational opportunity across urban/suburban/exurban lines.

ADMS 629. The Business of Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course presents financial considerations such as funding, revenue and expenditure audits; maintenance of a safe and productive learning environment; crisis management and media relations; physical plant management; meeting management; communication with internal and external publics; time management; and the ability to effectively navigate political waters. The approach to these constructs will be both diagnostic and prescriptive.

ADMS 630. Understanding and Engaging School Communities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will explore the broad social, economic, political and demographic shifts that have transformed metropolitan school communities over the past half century. Based on a deeper understanding of the complex forces that influence public education, students will develop leadership skills that focus on building relationships and communicating effectively with internal and external school communities.

ADMS 631. Evidence-based Decision-making. 1 Hour.
Semester course; 1 lecture hour. 1 credit. The purpose of this course is to prepare students to be critical consumers of research and to develop individual and group research skills. Students will learn to evaluate research quality, find available data within their schools and divisions, and collect and use new data. Students will learn to evaluate research quality in both single and synthesis studies. Additionally, students will be introduced to the action research cycle, be able to recognize and develop research questions, and determine an appropriate action research design.

ADMS 632. Administration and Supervision of Special Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of instructional practices and legal issues related to providing school programs for students with special needs. Appropriate field-based project relating theory to practice will be required.

ADMS 633. Multiple Dimensions of Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides participants with the opportunity to understand their own unique beliefs and dispositions regarding teaching, learning and leading as well as to understand the roles and responsibilities of educational leaders, including the Virginia Performance Standards for School Leaders and the ethical dimensions of leadership and policymaking. Various leadership models/theories are presented and explored.

ADMS 640. Human Resource and Fiscal Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of theories and policies related to resource projection and management in schools and school divisions. Finance topics include budget, purchasing and accounting, and procedures for obtaining equipment and materials. Human resource topics include staffing requirements, hiring, evaluation and dismissal procedures, and staff-personnel relationships. Appropriate field-based project relating theory to practice will be required.

ADMS 641. School Personnel Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of the personnel function in educational organizations. Designed to explore techniques and problems of staff-personnel relationships in contemporary education.

ADMS 643. The Community School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The development and utilization of the community school concept will be examined. Communitywide use of school facilities and the involvement of the total community in the learning process will be studied. Emphasis will be placed on the physical plant design, organizational structure, staffing and curriculum of the community school. The utilization of the community school to implement "lifelong learning" will be stressed.

ADMS 647. Educational Technology for School Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the impact of technology -- particularly Web-based technologies -- on K-12 instruction, from pedagogical considerations and associated tool choices to more pragmatic leadership issues of planning, funding and faculty development. This course is designed for administrators, teacher leaders and other interested professionals who are or intend to be leaders in technology. Crosslisted as: TEDU 647.

ADMS 651. Topics in Education. 1-3 Hours.
Semester course; 1-3 credits, repeatable for maximum of nine credits. Prerequisite: Check with department for specific prerequisites. A course for examination of specialized issues, topics, readings or problems in education.

ADMS 670. Administrative Internship I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. On-campus course. This course must be taken as one of the first courses in the first semester of enrollment. The course serves as an orientation to the internship experience, which is an integral component throughout the master's and/or post-master's program of studies. Students will learn the specifics of the entire internship component of the program, such as the 320 internship hours required, the scope of internship work, and the variety of experiences needed and means by which all internship experiences are to be documented throughout the program. Students will develop their individual internship plans, which will guide them through their internship experiences throughout their entire program. This plan will include specific field experiences in each required course as well as plans that will be executed in Administrative Internship II and Administrative Internship III, such that a total of 320 hours of experiences are accrued and documented by the end of the program. Graded as S/U/F.

ADMS 671. Administrative Internship II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisites: full admission status; no grades of Incomplete; evidence provided of meeting technology standards and completing child abuse/neglect recognition training; meet university's Graduate School academic requirements for graduation; adviser/department head approval of internship application; successful completion of ADMS 670. This course is to be taken in the semester immediately before Internship III. This course focuses on emerging topics from the students' internship experiences with emphases on leadership skills, professional dispositions and management. Field-based internship experiences developed in ADMS 670 are continued such that a total of 320 hours of experiences will be accrued and documented by the end of the entire program. A culminating experience taken at the end of the program, this course is designed for students to have opportunities to synthesize the essential knowledge and skills necessary to be a school leader. Reflection and refinement of skills and knowledge will be part of student-developed professional portfolio that could be used in securing a leadership position in a school system. Integration of theory and practice will take place in the internship as evidenced by documented experiences in a school/school district setting supervised by an approved professional and university instructor. Course will include seminars, selected readings, projects, discussion and other culminating activities. Graded as S/U/F.

ADMS 672. Principalship Seminar and Internship. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Full admission status; no grades of Incomplete; evidence provided of meeting technology standards and completing child abuse/neglect recognition training; meet university's Graduate School academic requirements for graduation; adviser/department head approval of internship application. A culminating experience taken at the end of program designed for students to have opportunities to synthesize the essential knowledge and skills necessary to be a school leader. Reflection and refinement of skills and knowledge will be part of student-developed professional portfolio that could be used in securing a leadership position in a school system. Integration of theory and practice will take place in internship of at least 120 hours in a school/school district setting supervised by an approved professional and university instructor. Course will include seminars, selected readings, projects, discussion and other culminating activities.

ADMS 675. Administrative Internship III. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: successful completion of ADMS 670 and 671. This course is continuation of the experiences in ADMS 670 and 671 and of seminar topics related to developing a personal portfolio and resume as well as interviewing skills. It provides a culminating review and professional reflection of the internship experiences. As part of successful completion of this course, 320 hours of documented internship experiences must be completed by the end of the program. Graded as S/U/F.

ADMS 700. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Prerequisite: Permission of department. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a setting, under supervision of an approved professional. Externship activities monitored and evaluated by university faculty.

ADMS 701. Education Policy Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines a set of applied research practices undertaken within a diverse community of scholars and analysts and that have implications for education. Explores processes involved in developing and implementing educational policy. Emphasis is given to the roles of federal and state governments in policymaking with attention to problems encountered in implementing educational policies. Focuses on research approaches relevant to policy research.

ADMS 702. Educational Administration: Contemporary Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of recent developments in administrative theory and the application of these theories to contemporary and future educational issues and problems.

ADMS 703. Leadership for Social Justice and Equity in Education. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits. Students will study and engage in dialogue related to the critical role of education in a democratic society in a rapidly changing and increasingly complex world. Through a focused discussion of theories and concepts such as democratic schools, social justice, critical theory and power, feminism, critical race theory, and difference/normalization, students come to understand the possible roles education can play in society and their need to continuously reflect on their own vision for leadership in public schools.

ADMS 704. Education Finance Policy and the Equitable Distribution of Resources. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In addition to a traditional examination of some of the aspects of the economic, legal, financial and budgeting policies affecting the equitable distribution of education resources in the U.S., the social justice implications associated with several established theories and policies in the field of education finance are examined. Specific topics include the historical and philosophical perspectives of U.S. education finance; education finance reform litigation; conceptions and measurements of equity, adequacy and efficiency in school finance designs; the role of federal, state and local governance in equitable education finance in the U.S.;, and the resource needs and organizational and fiscal implications of serving special populations in U.S. schools.

ADMS 705. Planning Educational Facilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of the theory, principles, criteria, procedures and practices of planning educational facilities and the modernization, maintenance and operation of existing facilities.

ADMS 706. Leadership Perspectives on Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores contemporary leadership perspectives on learning. This general theme is refined into three focus areas of current theory and practice: perspectives on what it means to learn, the ways in which digital technology factors into teaching and learning, and perspectives on the future of the formal K-12 learning enterprise.

ADMS 707. The Politics of Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of how the political structure of public education determines the nature of schooling. Study of political theory of education, macropolitics of education and schooling from micropolitical perspective leading to synthesis and development of critical understanding of the politics of education.

ADMS 708. Equal Educational Opportunity in the 21st Century Metropolis: Toward a Policy Framework. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides an overview of the economic, political and demographic shifts that have transformed metropolitan school systems over the past half century. Emphasis is given to the trajectory of education policy and leadership in light of these altered metropolitan spaces. Participants will evaluate the successes and pitfalls of contemporary and historical reforms as they relate to the distribution of educational opportunity across the urban/suburban/exurban divide. Culminating activities help students develop a framework for future policy efforts with a focus on the Richmond metro area.

ADMS 709. U.S. Educational Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will promote a critical examination and evaluation of the major strands of educational policy over the past half century.

ADMS 710. Current Topics in Educational Leadership and Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides advanced study on selected topic or emerging issue in U.S. educational policy or leadership.

Adult Education (ADLT)

ADLT 600. Adult Education Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a basic perspective on adult education. Presents a survey of the philosophical underpinnings of the field, including schools of thought and associated theorists, roles and functions of adult educators, agencies and organizations that sponsor adult education programs. Examines selected processes and procedures used by adult educators and current issues impacting adult education.

ADLT 601. Adult Learning and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of the research findings from the applied behavioral sciences that affect adult learning throughout the lifespan, including psychological, social and physical attributes of adults as learners. Explores the philosophical and theoretical foundations of the field, including schools of thought and associated theorists. Emphasis on the effects of age on learning, the importance of self-image and factors affecting adult motivation for learning. Addresses different learning styles, application of adult learning theories to practice and the relationship of adult learning to adult development.

ADLT 606. Design and Delivery of Adult Learning Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides a comprehensive understanding of the design, development and delivery process necessary to create a program, course or workshop for adult learners. Emphasis is on actual design of an adult learning experience from initial stages of needs assessment to concluding evaluation and assessment of effectiveness, including development of instructional strategies and methods for delivery.

ADLT 607. Writing Instruction for Adult Learners. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed for individuals interested in teaching adult literacy learners. Course participants will study and practice methods for the teaching of writing. This course is designed to provide an overview of the practices, research and application of instructional techniques for effectively working with adult learners in the writing classroom. Participants will be introduced to these techniques through readings from various websites, online documents and a required textbook.

ADLT 608. Adult Education Practicum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed for individuals interested in teaching adult literacy learners. This 120-hour field-based capstone experience for adult education students is an integral component of the professional preparation of adult education educators. The practicum must be supervised jointly by the adult education adviser at VCU's School of Education and the field supervisor in the adult education program in which the experience is being conducted.

ADLT 610. Consulting Skills In Adult Learning Environments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to the consultation skills necessary to effect change when the educator is in a position of influence, rather than direct control or management responsibility. Presents historical and theoretical models of change, facilitation skills necessary for introducing and sustaining change, strategies for dealing with resistance, and ethical issues involved in consultation. Students gain practical experience by conducting an intervention as the major project assignment in the course.

ADLT 612. Learning in Groups and Teams. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores fundamentals of learning in groups and teams, including effects of leadership, group member roles and processes, performance, development, goals, and culture. Examines group theory, models and practices of collective learning. Addresses the situated nature of learning, effects of social context and the concepts inherent in sustaining communities of practice.

ADLT 614. Curriculum Development for Adult Educators. 3 Hours.
Semester course delivered online; 3 lecture hours. 3 credits. Those wishing to apply this course to the five-course endorsement in adult literacy must be licensed to teach in Virginia, however a teaching license is not a prerequisite of the course. Designed to provide an overview of research and practice related to effective curriculum design. The course introduces models of program planning, curriculum development and evaluation appropriate for a variety of adult learners, including those requiring accommodations for disability, literacy, non-native English-speaking ability and multicultural backgrounds.

ADLT 620. Human Resource Development Overview. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the HRD field to include theories, practices and emerging concepts. Emphasis is on roles, functions and responsibilities of the HRD practitioner in supporting the strategies, mission and goals of the enterprise, whether public, private or nonprofit.

ADLT 621. Skills Development for Human Resource Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Develops skills and understandings critical to success as an HRD practitioner. Exposes students to techniques of instruction and survey instruments to gauge organizational climate and learning style differences. Emphasizes practical experience and issue analysis in gaining HRD skills that can be immediately employed.

ADLT 622. Human Resource Development Strategies and Interventions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines organizational development, nature of interventions, when to use them (and not use them), and a variety of models for aligning human resources capabilities with organizational needs. Focuses on introduction of change and transformation of organizational culture.

ADLT 623. Organizational Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the theoretical basis for organizational learning and the practices inherent in developing a learning organization. Examines organizational culture and socialization; systems thinking; organizations as interpretative systems; the leader's role in creating, sustaining and changing culture; strategies for enhancing collective learning; distributed cognition; and strategies for knowledge management.

ADLT 625. Change Strategies for HRD Practitioners. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Develops skills in change intervention strategies by employing the theoretical frameworks of organization development and organization transformation to address critical organizational issues and problems. Explores the HRD practitioner's role in facilitating organizational change through action research, action science, action learning and large-scale, whole-system interventions. Examines the differing roles and ethical issues for improving organizational effectiveness with special attention to organizational culture and a systems perspective of change.

ADLT 632. The Changing Face of Higher Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines how higher education is changing and explores the reasons for these changes; studies how the academy is responding to social pressures and explores scenarios for future change. Crosslisted as: EDUS 632.

ADLT 636. Capstone Seminar in Action Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Restricted to students who have completed all other foundation and core courses or are taking this course in conjunction with the final specialty track courses in the M.Ed. in Adult Learning program; permission of adviser required. An integrative end-of-program course that utilizes skills and knowledge gained in all earlier courses, including philosophical and theoretical assumptions of adult learning and strategies for creating effective individual and collective learning environments. Students consult with a community-based, educational, nonprofit or for-profit organization using action learning methods of inquiry to solve a real organizational problem. Requires synthesis of knowledge and expertise in all aspects of adult learning and demonstrated proficiency in research and evaluation skills appropriate for the master's degree level. An end-of-semester presentation and consulting report are provided to the organization's leaders.

ADLT 640. Theory and Practice of eLearning Integration Into Adult Learning Environments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides learners with a theoretical foundation and rationale for the successful integration of eLearning into formal and informal adult learning environments. This course begins with an overview of educational theory and social constructivist teaching philosophy before addressing the fundamental issues that instructional designers should consider when designing, delivering and assessing eLearning in adult learning environments. Note: This is a hybrid course.

ADLT 641. Exploration of Digital Media for Adult Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to engage students in an exploration of digital media to enhance adult learning. Through hands-on experience with tools, examination of emerging media formats and the evaluation of course learning products, students will learn to create, critique and explore a variety of digital media to support learning in a variety of instructional contexts. Special emphasis will be placed on using digital technology tools to support communication, knowledge building and learning in both formal and informal adult learning settings.

ADLT 642. Design Challenges in Creating eLearning for Adults. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides learners who have developed a deep understanding of the theoretical and philosophical underpinnings of instructional design in eLearning environments through ADLT 640 and who have developed fluency in developing content using new freely available digital media tools in ADLT 641 with an opportunity to undertake a major project in eLearning design. Note: This is a hybrid course.

ADLT 650. Adult Literacy and Diversity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Surveys the field of adult literacy and its many purposes, definitions, contexts and ideologies by exploring relationships between literacy and learning in numerous contexts, from corporate HRD programs to refugee communities. By applying analytical tools of critical theorists to raise awareness of the ideological nature of adult learning, and by examining contexts and foundations of adult literacy, the course takes up epistemological, ethical and instructional issues that relate to all aspects of adult learning.

ADLT 670. Curriculum Design in Medical Education. 2 Hours.
Hybrid course; 2 credits Restricted to faculty in the School of Medicine. Introduces adult learning principles and practices for the design and assessment of courses, units and individual lessons within a medical education curriculum in both preclinical and clinical settings.

ADLT 671. Theory and Practice of Adult Learning for Medical Educators. 2 Hours.
Hybrid course; 2 credits. Restricted to faculty in the School of Medicine. Provides an overview of the major adult learning theories that are applicable to medical education and explores how these form the basis for teaching and learning in medicine. Examines behavioral, cognitive, social, experiential and transformative learning orientations for relevance in medical education. Emphasis is on how knowledge is constructed and organized in the development of expertise.

ADLT 672. Instructional Strategies for Teaching in Medicine. 2 Hours.
Hybrid course; 2 credits. Restricted to faculty in the School of Medicine. Designed to provide medical educators with knowledge and skills practice in teaching effectively in large and small groups using discussion-based strategies, team-based learning, process-oriented guided inquiry learning and problem-based learning, as well as other active learning methods. Learners design and implement a small-group learning strategy appropriate for a medical education setting.

ADLT 673. Teaching as Scholarship in Medical Education. 2 Hours.
Semester course; 30 contact hours. 2 credits. Restricted to faculty in the School of Medicine. Orients the medical educator to basic design principles for conducting research that contributes to the scholarship of teaching and learning in medical education using qualitative, quantitative or mixed methods. Examines basic research paradigms, problem identification, question development, selection of methodology, IRB preparation and requirements for journal submission and publication.

ADLT 674. Performance Feedback and Simulation in the Medical Education Curriculum. 2 Hours.
Semester course; 30 contact hours. 2 credits. Restricted to faculty in the School of Medicine. Introduces medical educators to the use of simulated learning experiences in preparing health care professionals for patient care. The emphasis is on acquiring skills to develop and lead simulation exercises and on developing facilitation skills needed to provide effective feedback to debrief the activity. Requires hands-on observation and participation in simulation at the VCU Center for Human Simulation and Safety.

ADLT 675. Group and Team Facilitation for Medical Educators. 2 Hours.
Semester course; 30 contact hours. 2 credits. Restricted to faculty in the School of Medicine. An introduction to the nature of learning in groups and teams. The course explores basic issues fundamental to all groups such as leadership, goals, group member roles, stages of group and team development, issues in team performance and an understanding of how institutional culture shapes group behavior.

ADLT 676. Digital Media Technologies for Teaching in Medicine. 2 Hours.
Semester course; 30 contact hours. 2 credits. Restricted to faculty in the School of Medicine. Introduces digital media technologies to bring state-of-the art teaching and learning strategies into the medical education curriculum. Explores Web 2.0 tools including wikis, blogs, podcasts and other emerging media, as well as the evaluation of digital media technologies to support learning in the preclinical or clinical curriculum. Emphasis is on building student engagement and community through participatory strategies for learning.

ADLT 677. Reflective Practice in Medical Education. 2 Hours.
Semester course; 30 contact hours. 2 credits. Restricted to faculty in the School of Medicine. Introduces the concept of reflective practice for medical educators, including the educator's role in developing trainees as reflective practitioners and the role of reflection in one's own professional development. Includes the concept of narrative medicine as a reflective practice that enables a more holistic understanding of patients and their illnesses, with application for the education of medical professionals.

ADLT 688. Lifespan Issues for Adults with Learning and Behavioral Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the literature, research, issues and best practices for the population of individuals with learning disabilities and behavior disorders (including ADHD) beyond the school-age years. Focus on disabilities as they are manifested in a variety of settings and contexts in which adults with learning and behavior disorders function. These include areas such as employment, post-secondary education, community, family and leisure. In addition, social-emotional functioning and daily living challenges will be interspersed in the course material. Course goal is to develop understanding and the skill of critical reflection about persons with learning disabilities and behavior disorders in their adult years.

ADLT 702. Seminal Readings in Adult Learning Literature. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A seminal readings course to explore some of the prominent classics in adult learning literature. Designed for doctoral students in adult learning and other disciplines in which knowledge and understanding of the theoretical underpinnings of adult education is desirable as a foundation for effective pedagogy/andragogy. While prior participation in a master's-level adult learning theories class may be beneficial, it is not a prerequisite.

Counselor Education (CLED)

CLED 501. A Survey of the Counseling and Human Services Professions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introductory course for any student interested in pursuing a career as a counselor or human services professional. Students will explore their personal motivation and interest in a counseling or human services profession as well as integrate professional concepts with personal style.

CLED 520. Diversity Issues in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides an overview of diversity in age, religion, race, ethnicity, socioeconomic status, sexual orientation and gender identity in society. Students will examine how human relationships are influenced from a multicultural perspective.

CLED 600. Professional Orientation and Ethical Practice in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to counselor education program or permission of instructor. An introductory course for all students in counselor education that provides an overview of the counseling profession and explores ethical and legal standards in the counseling field. The course focuses on ethical standards of professional organizations, federal and state legal mandates and the application of ethical and legal considerations in counseling practice.

CLED 601. Theories of Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to counselor education program or permission of instructor. Selected theories upon which counseling is based, with particular attention placed on the research underlying the theories. Primary focus on providing students with a theoretical foundation upon which to base their personal counseling approaches.

CLED 602. Techniques of Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires admission to counselor education program or permission of instructor. Theory and practice of counseling with emphasis on skill development.

CLED 603. Group Procedures in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: CLED 600, CLED 601 and CLED 602. Analyzes the theories and practice of group work, the relationship of group activities to counseling, and specific skills in group techniques.

CLED 604. Practicum: School Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 603; and CLED 613 or CLED 622. Seminar and supervised field experience in individual and group counseling and classroom group guidance.

CLED 605. Career Information and Exploration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 600 and 601. Designed to provide the potential counselor with an understanding of theoretical approaches to career development in grades K-adult. Emphasis will be given to the relationship between counselor and student(s) in the career development process. A review of occupational, educational and personal/social information resources will be made.

CLED 606. Assessment Techniques for Counselors. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 600 and 601. Principles and techniques involved in selecting, scoring and interpreting standardized and nonstandardized assessment instruments used by counselors.

CLED 607. Multicultural Counseling in Educational Settings. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: instructor approval. A study of personal, social, political, affective and behavioral considerations of diversity. Multicultural competencies including awareness, knowledge and skills in counseling are emphasized. Efforts will be made to provide school counselors and postsecondary student affairs professionals with practical skills, strategies and techniques for use when working with students and families from a variety of cultural backgrounds.

CLED 608. Practicum: College Student Development and Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 603, CLED 605 and CLED 660; and CLED 620 or CLED 631. Seminar and supervised field experience in student services in postsecondary educational settings.

CLED 610. Counseling in Elementary and Middle Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 600 and 601. An intensive study of school counseling programs for children and young adolescents. Emphasizes the role of elementary and middle school counselors in developmental guidance. Methods for classroom guidance will be discussed.

CLED 612. Seminar in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to counselor education program or permission of instructor. A survey course that introduces various theories and strategies that support wellness and development. Topics include counselor and client wellness, supervision, psychopathology, crisis intervention, suicide prevention and theories on addictions.

CLED 613. Data-driven Comprehensive School Counseling Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to counselor education program or with permission of instructor. Considers the history of the pro¬fession, current issues and future trends. Addresses professional organizations and ethical guidelines and will focus on the role of school counselors in becoming advocates for students and leaders in the school environment.

CLED 615. Lifespan Development: A Gender Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Overview of human development theories and the impact of cultural gender messages on the developmental process. Crosslisted as: EDUS 615.

CLED 620. Student Development Services in Higher Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: CLED 600 and CLED 601 or by permission of instructor. An overview of the organization and management of student services in postsecondary institutions. Areas such as admissions, career services, academic advising, residential life, financial aid, student development services, student union programming and management, and student activities are reviewed.

CLED 621. Secondary School Counseling Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 600 and 601. An advanced course designed to provide a means for intensive study of secondary school counseling. The approach will be to integrate professional knowledge and skills from various disciplines as they relate to the work of the secondary school counselor.

CLED 622. School Counseling Services. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to counselor education program or with permission of instructor. Focuses on the organization, administration and delivery of school counseling services in pre-K-12 schools.

CLED 630. Clinical Supervision in the Counseling Profession. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Selected theories upon which clinical supervision in the counseling field is based, with particular attention placed on the research underlying the theories. Primary focus on providing students with a theoretical foundation upon which to base their supervision practice.

CLED 631. American College and University. 3 Hours.
3 credits. Examines historical and contemporary foundations of American higher education through the study of leading developments and of contemporary issues relating to the curriculum, aims and objectives and current directions of American colleges, universities and other institutional settings of higher education. Crosslisted as: EDUS 631.

CLED 633. Academic Leadership in Higher Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyzes how leadership in higher education is similar to and different from leadership in other organizational settings; explores challenges for leadership (such as access, cost and social responsiveness) and examines emerging leadership roles at various levels of the academic organization. Crosslisted as: EDUS 633.

CLED 640. Marriage, Couples and Family Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CLED 600 and CLED 601. This course provides students with an overview of the processes and theories involved with counseling couples and families. The focus is on preparing students to think systemically and to learn about family concepts, development, dynamics, theories, assessments and techniques. Counseling experience and feedback from the instructor and classmates will be provided. Students will use critical reflection throughout the semester while meeting the requirements of this course.

CLED 642. Organization and Administration of Guidance Services. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of organizational principles and procedures necessary for the effective administration of guidance services. Consideration is given to procedures used in establishing guidance programs or modifying existing ones (or both), including the study of various community resources that can contribute to more efficient guidance services.

CLED 650. Addiction Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is an entry-level graduate course that provides counselors and other human service workers with an overview of the addictive process. Theories of addiction counseling and application of these theories will comprise a significant part of this course, particularly with how they apply to work with individuals, couples, families and groups. Co-occurring disorders, such as process addictions and mental illnesses will also be addressed. Students will develop conceptual knowledge, practical skills and self-awareness concerning the etiology of addiction, assessment strategies (including the use of wraparound assessment and intervention services), wellness strategies for facilitating optimal development and preventing clinician burn-out, and diagnosis and treatment planning. This will be accomplished through assigned readings, seminar discussions, videotapes, lectures, case presentations, guest speakers and student assignments.

CLED 660. Mental Disorders, Diagnosis and Treatment Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: CLED 603. The course examines the history, paradigms, theory and practice of mental health diagnosis, with primary emphasis on the identification of issues related to thinking (cognition), feeling (affect) and acting (behavior) upon which diagnoses are based. The purpose of this course is for students to become familiar with the study of mental disorders and learn the system of classification of mental disorders, the DSM-5.

CLED 672. Internship. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Must be repeated for a total of at least six credit hours. Enrollment requires completion of all other CLED courses required for program. Seminar and supervised field instruction experience for counselors in K-12 settings or professionals in postsecondary settings. Designed to extend professional competencies under supervision of an approved licensed professional school counselor (K-12 settings) or approved student services professional (postsecondary settings). A total of 600 clock hours is required.

CLED 720. Counselor Education Doctoral Seminar I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Theories and skills of leadership, advocacy models, advocacy action planning and social change theories. Models and methods of program evaluation are examined and evaluations designed and implemented as part of leadership and advocacy efforts. Students demonstrate the ability to provide or contribute to leadership efforts of professional organizations/programs and to advocate for the counseling profession and its clientele.

CLED 721. Counselor Education Doctoral Seminar II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Instructional theory, counselor education methods and multicultural pedagogy, and the roles, responsibilities and activities of counselor educators. Students demonstrate course design, delivery and evaluation methods. Students also develop their professional writing skills and demonstrate the ability to write for journals, newsletters, presentation proposals and grant proposals related to the teaching and training of counselors.

CLED 730. Advanced Counseling Theories and Practicum. 3 Hours.
Semester course; 3 lecture hours and 100 on-site hours. 3 credits. Pre- or corequisite: CLED 720. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Theories pertaining to the principles and practice of counseling, systems work, consultation and responding to crises, disasters and other trauma-causing events. Students demonstrate, at an advanced level, effective application of multiple counseling theories and interventions across diverse populations and settings, as well as advanced case conceptualization. This course includes a supervised 100-hour doctoral-level practicum.

CLED 740. Supervision in Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CLED 730; pre- or corequisite: CLED 721. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Purposes, theoretical frameworks, models, roles of relationship, and practices of counselor/ clinical supervision. Students develop and demonstrate the application of theory and skills of clinical supervision as they refine their personal style of supervision.

CLED 750. Advanced Group Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CLED 740. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Therapeutic factors of group work, theories of group work, including group counseling, evaluation of group work, group leadership characteristics, styles and behaviors. Students will demonstrate advanced group work skills and the ability to evaluate group climate, group leadership, group process and group outcomes.

CLED 760. Advanced Career Counseling and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: CLED 740; pre- or corequisite: CLED 750. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Principles and practice of career counseling, career counselor supervision and career program development beyond the beginning level. Students will demonstrate advanced career counseling work with a client, and beginning-level career counseling supervision. Part of this course includes developing and writing an article for publication based upon a theory-based career intervention structured in social justice and advocacy.

CLED 810. Counselor Education Doctoral Internship. 1-4 Hours.
Semester course; variable hours. 1-4 credits. May be taken for a total of 6 credits. Prerequisite: CLED 760. Restricted to students admitted to counselor education concentration of the Ph.D. in Education program. Supervised experiences in counselor education and supervision (e.g., clinical practice, supervision, research and/or teaching). Internship is at the discretion and approval of the doctoral adviser and is based on student experience, training and career goals. The setting, goals, site supervisor and plan for the internship must be approved by the doctoral adviser. Students receive weekly supervision from their site supervisor and group supervision from a counselor education faculty member.

Early Childhood Special Education (ECSE)

ECSE 500. Language/Communication Intervention for Young Children with Disabilities. 3 Hours.
Semester course; 3 lecture hours; 3 credits. Offered in hybrid format. Undergraduate students must have permission of the instructor prior to registration for this course. This course emphasizes how children learn to communicate and how to facilitate communication development. The course includes examination of language development, language differences and disorders, language facilitation, and relationship of language to literacy. Course content and assignments include information about evidence-based practices and promote critical reflection and problem-solving skills.

ECSE 541. Educational Foundations for Collaboration and Universally Designed Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Course offered online. Undergraduate students must have permission of the instructor prior to registration for this course. This course focuses on the foundations for early intervention and education, with emphasis on early intervention research, typical and atypical development, family and community contexts for development, professional standard and current policy issues.

ECSE 542. Family/Professional Partnerships. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Undergraduate students must have permission of the instructor prior to registration for this course. Theory and practice relevant to working with families of children with disabilities. Family-centered services and cultural sensitivity are emphasized. Provides an overview of family processes and reactions to having a child with a disability, strategies for helping family members support and work with their children, available community resources and legal rights of families and children with disabilities.

ECSE 601. Assessment of Infants and Young Children with Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides knowledge and practical applications for the identification, placement and assessment for program planning and evaluation of children with disabilities ages birth through five.

ECSE 602. Instructional Programming for Infants and Young Children with Disabilities. 3 Hours.
Semester course; 3 lecture hours; 3 credits. Offered in hybrid format. This course provides the knowledge, skills and methods necessary to deliver effective education to infants, toddlers and preschoolers with disabilities and their families. The course includes readings, discussions and activities on topics central to understanding the conceptual and theoretical foundations underlying current educational curricula and methods. The course emphasizes blending recommended practices from early childhood education and early childhood special education, family-centered service delivery, cultural competence, inclusive placements, and research-based intervention. Course content and assignments promote critical reflection, collaborative decision-making and problem-solving skills to be used in planning and implementing programs for young children with special needs and their families.

ECSE 603. Integrated Early Childhood Programs I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Offered in hybrid format. Examines the needs, opportunities, resources and barriers to early intervention and inclusive early childhood programs in Virginia and local communities. State and federal laws and policies, research-based practices and local models will be studied to understand the context for systems change. A planning process that includes funding mechanisms, staffing patterns, curricula service models, family participation options, resource coordination and program evaluation procedures will be emphasized.

ECSE 604. Early Literacy and Augmentative Communication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to increase the professional knowledge and skills of early childhood special educators to meet the literacy needs of young children with disabilities through the use of technology.

ECSE 605. Integrated Early Childhood Programs II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: ECSE 603. Examines the needs, opportunities, resources and barriers to early childhood intervention and inclusive early childhood programs in Virginia and local communities. State and federal laws and policies, research-based practices, and local models will be studied to understand the context for systems change. A planning process that includes funding mechanisms, staffing concerns, curricula service models, family participation options, resource coordination and program evaluation procedures will be emphasized.

ECSE 641. Interdisciplinary Methods in Early Intervention. 3 Hours.
Semester course; 3 lecture hours; 3 credits. Offered in hybrid format. This course focuses on the nature and characteristics of major disabling and at-risk conditions for infants and young children and the influence of interdisciplinary teamwork in service delivery. Emphasis is given to the medical aspects of young children with disabilities and the management of neurodevelopmental and motor disabilities. Review of adaptive equipment and its safe use, as well as selection and implementation of appropriate assistive technology will be covered. The importance and role of collaborative planning teams that include families and professionals from various disciplines, including health care, will be discussed. Essential teamwork skills will be learned and students will reflect on the application of those skills in practice.

ECSE 672. Internship in Early Development and Intervention. 1-6 Hours.
Semester course; 1 or 2 lecture hours. 1 or 2 credits. May be repeated. Designed to provide practical experience in different community programs that serve young children (birth to 5) from various cultural and linguistic backgrounds, who are at risk for or have developmental disabilities, and their families. These observation, participation and service-learning experiences are distributed across the graduate program, linked to other core content courses documented via portfolios and aligned with professional standards.

ECSE 700. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Prerequisite: Permission of department. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a setting, under supervision of an approved professional. Externship activities monitored and evaluated by university faculty.

Education (EDUC)

EDUC 700. Externship. 1-6 Hours.
Semester course; 1-6 practicum hours. 1-6 credits. May be repeated for a maximum of 9 credits. Enrollment requires permission of department. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a setting, under supervision of an approved professional. Externship activities monitored and evaluated by university faculty.

EDUC 797. Directed Research. 1-9 Hours.
Semester course; 1-9 variable hours. 1-9 credits. Enrollment restricted to students who have completed first-year Ph.D. courses in education or by permission of program director. The course provides doctoral students the opportunity to do hands-on research prior to the dissertation project that is relevant to their substantive area or individual learning needs. The topic and specific project will be initiated by the student and implemented in collaboration with a School of Education faculty member. A proposal for a directed research course must be submitted that specifies how the student will gain experience, knowledge and skills in one or more aspects of conducting a research project. Graded S/U/F.

EDUC 798. Thesis. 1-6 Hours.
Semester course; 1-6 variable hours. 1-6 credits. May be repeated for a maximum of 6 credits. A research study of a topic or problem approved by the student's supervisory committee and completed in accordance with acceptable standards for thesis writing. Graded S/U/F.

EDUC 899. Dissertation Research. 1-9 Hours.
Semester course; 1-9 variable hours. 1-9 credits. May be repeated. A minimum of 6 semester hours required. Enrollment restricted to students who have successfully completed comprehensive examinations. Dissertation work under direction of dissertation committee. Graded as S/U/F.

Educational Leadership (EDLP)

EDLP 700. Effective Learning Networks. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores theory and research regarding characteristics of effective leaders, team members and organizations. Participants are administered personal inventories related to leadership skills; team-building and -participation skills; learning preferences; preferences for processing information and for decision-making. Results of inventories are analyzed, combined with learned theories and applied to practical situations.

EDLP 702. Understanding Self as Leader: Theory and Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDLP 700. Presentation of leadership and organizational theory. Study of statistical analyses appropriate for data sets provided in learning inventories and case studies. Critical analyses of research in the field related to leadership styles, personal inventories and organizations/communities as systems. Applications of theory, research and case-study analysis findings to organization/community settings.

EDLP 703. Understanding Self as Leader: Practical Applications. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: EDLP 700. Corequisite: EDLP 702. Applications of theory, research and case-study analysis findings to organization/community settings. Seminar discussions of applications to equity, accountability and learning issues.

EDLP 704. Frameworks for Decision-making: Legal Perspectives. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Critical analyses of legal research, theory and laws related to case studies provided. Critical analysis of legal and policy issues, as well as policy development/implementation theory. Applications of research, laws and policies related to the case studies provided.

EDLP 705. Frameworks for Decision-making: Ethical Perspectives. 3 Hours.
Semester course; 3 lecture hours. 3 credits. In-depth analyses of issues and problem-solving using research, ethics theory and frameworks. Application of research and theory to development of solutions in focused area of study.

EDLP 708. Leadership Presence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: EDLP 709. Selected topics for fostering effective leadership with particular attention placed on leadership presence, crisis response and public relations. The course will focus on facilitating leadership skills through better understanding of enhancing time management skills, fostering communication skills and leadership presence and planning for crisis.

EDLP 709. Equity and Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: EDLP 708. Selected topics for fostering effective leadership with particular attention placed on equity and leadership. The course will focus on enhancing leadership skills through better understanding of equity issues and student psychosocial development.

EDLP 711. Evidence-informed Perspectives on Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. This course implements a collaborative approach to the theory-infused practice of program evaluation in education. Participants will hone their project-planning expertise and their data-gathering and data-analysis skills in the process of both contributing to ongoing evaluation research and preparing to conduct evaluations of programs of their own choosing in their own school divisions. The course culminates in the production of an interim report which is delivered to the "client" and which sets the stage for Evidence-informed Perspectives on Practice II.

EDLP 712. Planning for Sustainable Change I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Using a case-study approach, students will focus on theory and research regarding implementing change in organizations, with attention to organizational culture as a context for change. The course addresses laws, policies and research regarding improvement plan development, implementation and evaluation.

EDLP 713. Evidence-informed Perspectives on Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDLP 711. This course builds on the foundation laid in EDLP 711. Students are mentored as they proceed throughout the semester to develop and enhance their earlier program review plan and interim report. Students establish a literature foundation for the ongoing evaluation of the program they chose to evaluate; gather further data by means of interviews, focus groups, document review; and analyze data to develop conclusions and recommendations. The summative product of this course includes an executive summary, a full report and a binder of relevant data.

EDLP 714. Planning for Sustainable Change II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDLP 712. Case study approach. Application of theory, laws, research to developing plans for implementing change, based upon case being studied. Study of methods for documenting, evaluating effectiveness of plan implementation and change implementation/sustainability.

EDLP 715. Principles for Professional Writing I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Study of scholarly writing styles and report formats appropriate to various audiences. Development of comprehensive written product suitable for distribution in student's setting. Focus is on conveying themes and drawing conclusions from scholarly research.

EDLP 716. Principles for Professional Writing II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDLP 715. Study of scholarly writing styles and report formats appropriate to various audiences. Development of comprehensive written product suitable for distribution in student's setting. Focus is on conveying themes and drawing conclusions from scholarly research.

EDLP 717. Communicating Research Findings. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Study of data analysis methods relevant to capstone project. Styles and methods of writing related to conveying results of data analyses, including development of graphs, tables, charts and figures, and presentation materials.

EDLP 790. Capstone Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Supervised research. Client-based project. Designed to develop and refine the skills applicable to the preparation of an acceptable description of a capstone project. Development of background, review of research, project objectives and methods for gathering data, in consultation with capstone chair and client.

EDLP 798. Capstone Plan Implementation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDLP 790. Supervised research. Client-based project. Conducting of research related to project developed in EDLP 790, with guidance from capstone project chair and client. Study of data management processes. Development of interim reports for capstone committee and client. Graded as S/U/F.

EDLP 799. Capstone Completion. 3 Hours.
Semester course; variable hours. 1-3 credits. Prerequisite: EDLP 798. Supervised research. Client-based project. Continuation of capstone implementation. Focus on developing conclusions and recommendations based upon data analyses. Presentation of capstone project to capstone committee and client. Graded as S/U/F.

EDLP 890. Dissertation Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of director of doctoral studies. Designed to develop and refine the skills applicable to the preparation of an acceptable draft of a dissertation prospectus. Crosslisted as: EDUS 890.

Educational Studies (EDUS)

EDUS 500. Workshop in Education. 1-3 Hours.
Semester course; 1-3 credits. Repeatable to 6 credits. Designed to focus on a single topic within a curriculum area, the workshop offers graduate students exposure to new information strategies and materials in the context of a flexible instructional framework. Activities emphasize a hands-on approach with direct application to the educational setting.

EDUS 514. Parent-child Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A methods course in parent-child communications and problem solving. Designed to enable parents and professionals to understand and relate more effectively with children.

EDUS 594. Topical Seminar. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. A seminar intended for group study by students interested in examining topics, issues or problems related to teaching and learning.

EDUS 601. Philosophy of Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of basic philosophies that have contributed to the present-day educational system. Attention will be given to contemporary philosophies and their impact on educational aims and methods.

EDUS 602. Adolescent Growth and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Contemporary learning theories and their implications for teaching the adolescent learner. Emphasis will be placed on specific problems of adolescent growth and development as they relate to the learning situation.

EDUS 603. Seminar in Child Growth and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Intensive study of child growth and development and application of this knowledge. Emphasis on current research.

EDUS 604. Adult Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introductory study of adult development from the life cycle perspective with implications for educators working with adults. Emphasis will be placed on major physiological, psychological, sociological, and anthropological factors that make adults distinct from earlier developmental levels.

EDUS 605. Child and Adolescent Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines theory and practical applications of the research about the cognitive, social and physical development of children and adolescents. Emphasizes issues that affect students in school environments.

EDUS 606. Review of Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for a maximum of 9 credits. Application of research findings to a specific educational area of study. Emphasis is on the consumption and utilization of research findings rather than the production of research evidence.

EDUS 607. Advanced Educational Psychology for Elementary Teachers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Application of the principles of psychology to the teaching-learning process in the elementary classroom. Discussion will focus on the comprehensive development of individual learning experiences and educational programs from the point of view of the educator and administrator. Crosslisted as: PSYC 607.

EDUS 608. Educational Statistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT 508 or equivalent. An intermediate-level statistics class focusing primarily on techniques of inferential analysis. The purpose of this course is to facilitate students' development of the skills required to come up with a research hypothesis and analyze data to confirm or deny said hypothesis. Students will conduct data analysis using the National Center for Education Statistics Educational Longitudinal Study of 2002. Students will specifically consider the development of theoretically grounded hypotheses and the use of a variety of statistical techniques to enable their testing. The class will focus in particular on multiple regression with two or more independent variables and the psychometric analysis of measurement scales intended to tap variables used in the models developed. Students will also consider curvilinear relationships, factor analysis and power analysis. Students who successfully complete the course should have the ability to analyze complex data sets and construct measures that enable the testing of hypotheses that advance theory, research and practice in the field of education.

EDUS 609. Learning and Motivation in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines perspectives on learning and motivation in school settings.

EDUS 610. Social Foundations of Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of significant social issues involved in the development and operation of schools and other educational institutions and processes.

EDUS 612. Education and the World's Future. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of education as it relates to future changes in other areas: population, energy, transportation, family, etc. The course will consist of readings dealing with educational change as well as a series of modules where students will engage in future exercises, games and projects.

EDUS 613. Educational Change. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Developing the skills for planned program change through the use of systematic inquiry, systems analysis and systems approaches through systems concepts. Provides opportunities for students to develop "mini (classroom) changes" or "macro (school district) changes" through the use of systems.

EDUS 614. Contemporary Educational Thought. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will be devoted to a critical examination of educational ideas and programs emanating from contemporary writings on education. Students will be encouraged to develop critical skills of analysis in examining such writings utilizing historical and philosophical perspectives.

EDUS 615. Lifespan Development: A Gender Perspective. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Overview of human development theories and the impact of cultural gender messages on the developmental process. Crosslisted as: CLED 615.

EDUS 617. Advanced Educational Psychology for Secondary Teachers. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Application of the principles of psychology to the teaching-learning process in the secondary classroom. Discussion will focus on the comprehensive development of individual learning experiences and educational programs from the point of view of the educator and administrator. Crosslisted as: PSYC 657.

EDUS 620. Human Development in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Doctoral seminar that examines issues in human development as they relate to the education of youth and young adults.

EDUS 621. Motivation in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Doctoral seminar that examines issues in motivation as they relate to teaching and learning.

EDUS 631. American College and University. 3 Hours.
3 credits. Examines historical and contemporary foundations of American higher education through the study of leading developments and of contemporary issues relating to the curriculum, aims and objectives and current directions of American colleges, universities and other institutional settings of higher education. Crosslisted as: CLED 631.

EDUS 632. The Changing Face of Higher Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines how higher education is changing and explores the reasons for these changes; studies how the academy is responding to social pressures and explores scenarios for future change. Crosslisted as: ADLT 632.

EDUS 633. Academic Leadership in Higher Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyzes how leadership in higher education is similar to and different from leadership in other organizational settings; explores challenges for leadership (such as access, cost and social responsiveness) and examines emerging leadership roles at various levels of the academic organization. Crosslisted as: CLED 633.

EDUS 641. Independent Study. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Determination of the amount of credit and permission of the instructor and department chair must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in education.

EDUS 651. Topics in Education. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for 9 credits. Check with department for specific prerequisites. A course for the examination of specialized issues, topics, readings or problems in education.

EDUS 660. Research Methods in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide an introductory understanding of educational research and evaluation studies. Emphasizes fundamental concepts, procedures and processes appropriate for use in basic, applied and developmental research. Includes developing skills in critical analysis of research studies. Analyzes the assumptions, uses and limitations of different research designs. Explores methodological and ethical issues of educational research. Students either conduct or design a study in their area of educational specialization.

EDUS 661. Educational Evaluation: Models and Designs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDUS 660 or permission of instructor. A comprehensive review of the major evaluation theories and models including their focus, assumptions, designs, methodologies and audiences in educational policy making and program development. Designed for students to gain an understanding of alternative procedures of educational evaluation, an in-depth knowledge of at least one theoretical approach to evaluation and skills in interpretation of evaluation studies for policy and in developing an evaluation design for their area of specialization.

EDUS 662. Educational Measurement and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an understanding of basic concepts of educational measurement and evaluation. Includes development, interpretation and use of norm-referenced and criterion-referenced measures, standardized instruments and qualitative assessments applicable to a wide variety of educational programs and settings. Students study in-depth measurement and/or evaluation procedures in their specialization.

EDUS 672. Internship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 12 credits. Prerequisite: Permission of adviser. Study and integration of theory with practice in clinical or off-campus settings supervised by an approved professional and university faculty. May include seminars, selected readings, projects and other activities designed and evaluated by supervising faculty.

EDUS 673. Seminar on Educational Issues, Ethics and Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An analysis of the ethical dimensions of educational policies and practices. Examines aspects of selected educational policies and practices, drawn in part from practical issues encountered in clinical settings. Investigates how educational policies and practices reflect ethical values and how those values are grounded.

EDUS 701. Urban Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of urban education from historical and contemporary perspectives. This course includes study of the educative effect of urban environments; the development of public and private urban educational systems; the influence of social, political, and economic factors on urban educational programs; and the impact of theories, proposals, and practices on alternative futures.

EDUS 702. Foundations of Educational Research and Doctoral Scholarship I. 3 Hours.
3 lecture hours. 3 credits. This interdisciplinary seminar is the first part of a two-semester sequence. Students will learn about the nature of scholarly inquiry and the worth of situating research within its wider social and political contexts. Course will deal with limitations of knowledge and knowing and aid students in understanding major themes in the field of epistemology. Emphasis will be given to the nature and structure of knowledge and evidence, justification of beliefs, beliefs about "truth," naturalized epistemology and the role of skepticism in inquiry and advanced study. EDUS 702 and 703 are continuous courses.

EDUS 703. Foundations of Educational Research and Doctoral Scholarship II. 3 Hours.
3 lecture hours. 3 credits. Prerequisite: EDUS 702. This interdisciplinary semester is the second part of a two-semester sequence. Students will deepen their understanding of scientific inquiry and apply an understanding of epistemology to a critical analysis of various philosophies of research and paradigms that exist (e.g.: positivism, constructivism, etc.). Emphasis will be placed on the relationships among research, politics, policy and ethics. Examples will be drawn from research on urban issues and deal with issues such as race, class and gender in education. EDUS 702 and 703 are continuous courses.

EDUS 706. Educational Theory and Praxis in Historical and Contemporary Contexts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar focuses on philosophies of education with particular attention paid to ways of thinking about seminal ideas and their relationships to education and social, institutional, economic and cultural change in the U.S. It considers how broader social phenomena affect the purposes and structures of educational institutions as well as how educational change affects wider society. Additionally, it highlights challenges for social change within and through public schools given institutional, social and political influences. Key topics include: schooling for democracy; progressivism, pragmatism and education; eco-education; behaviorism and social utopias; multiculturalism/pluralism; contemporary political educational discourse; and the roles of theory/philosophy in education. This course offers opportunity for students to engage with theories of social change that place education/schooling at the center. It provides space for students to develop a philosophical framework for their work as well as a means to deepen their understandings of educational research, policy and theory. Finally, this course requires students to begin to put their ideas into action in educational and other social contexts by means of a community engagement/organization component. The worth of engaging with and not just learning about the curriculum, culture and change is a core value of the program and in this course we will work hard to both study about and participate in the overlapping worlds of theory/academia and education-related social action.

EDUS 707. Socio-cultural Perspectives on Schooling, Society and Change. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar focuses on the critical analysis of contemporary schooling in the U.S. and investigates how educational institutions work from a sociological-cultural perspective. The structure of schooling is analyzed through such topics as the social organization of schooling, stratification within and among schools, youth culture and student peer groups, curriculum and the stratification of knowledge, and equality of educational opportunity as mitigated by such factors as social class, race, ethnicity and gender. Discussions about current social theories and debates in education are combined with lessons drawn from social justice-based research on the politics of schooling and institutional transformation. In sum, the course provides a framework for informed participation in debates on controversial educational issues at the macro level, including school reform and educational policy, thereby equipping future curriculum and instruction leaders with the tools they need to affect change.

EDUS 710. Quantitative Research Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EDUS 660 or equivalent, and a graduate-level statistics course, or permission of instructor. An examination of quantitative research designs and concepts commonly utilized in conducting research in applied educational settings. Fundamental principles of research are extended to cover such topics as quasi-experimental and nested designs, experimental validity and alignment of statistical procedures with designs.

EDUS 711. Qualitative Methods and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate-level statistics course, and EDUS 660 or equivalent, or permission of instructor. Examines qualitative research designs and inductive analysis, including research traditions, problems formulation in fieldwork, purposeful sampling, interactive data collection strategies, research reliability and validity. An interdisciplinary approach is used. Students conduct a small field study in their specialization.

EDUS 712. Mixed Methods Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate-level statistics course, EDUS 660 and EDUS 711 or equivalents, or permission of instructor. Examines mixed methods research designs, including the major philosophical perspectives of mixed methodology, as well as the challenges and strategies for data collection and analysis procedures across designs.

EDUS 720. Seminar in Cognition and School Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines topics in cognition that explain students' learning such as expertise, problem solving, cognitive strategies instruction and development of the knowledge base. Supportive instructional techniques will also be considered.

EDUS 721. Advanced Seminar in Social Processes in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the theoretical/conceptual and empirical bases of various social processes and their relationship to educational outcomes. The content covered is designed to provide students with a survey of literature and research on a number of topics that examine these relationships from individual, contextual/environmental and policy perspectives. Current developments with regard to research methodologies in these areas will also be considered.

EDUS 790. Educational Research Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides doctoral students with opportunities to investigate research areas related to their doctoral studies. Students and instructor will critique student conducted literature reviews and preliminary research proposals.

EDUS 795. Professional Seminar in Educational Issues. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Limited to students in Ph.D. in Education program. Interactive seminar discusses contemporary educational issues based on research in the historical, philosophical, psychological, sociological, political and economic foundations of education. Includes active participation by students as well as guest lectures by scholars from various academic disciplines.

EDUS 890. Dissertation Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of director of doctoral studies. Designed to develop and refine the skills applicable to the preparation of an acceptable draft of a dissertation prospectus. Crosslisted as: EDLP 890.

English/English Education (ENED)

ENED 532. Applied English Linguistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated for credit. Prerequisite: ENGL 390. Application of linguistic theories and methods to selected teaching problems, such as teaching English grammar and usage, teaching English as a second or foreign language, or teaching standard English to students who speak different dialects. Crosslisted as: ENGL 532.

ENED 601. Young Adult Literature. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of literature written for young adults, literature appropriate for young people in middle schools and high schools. Focuses on the content, characteristics and teaching of such literature. Crosslisted as: ENGL 601.

ENED 636. Teaching Writing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines theories and practices of teaching writing, with emphasis on the connections between theory and practice. Crosslisted as: ENGL 636.

Interdisciplinary Developmental Disability Studies (IDDS)

IDDS 600. Interdisciplinary Studies in Developmental Disabilities: Teamwork in Serving Persons with Developmental Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides information and activities on models of teamwork, group decision making, team process, leadership and communication and how they influence services for persons with disabilities and their families; content/discussion focuses on the roles and functions of individuals from various disciplines (including parents) as team members; includes case studies and simulations of interdisciplinary teamwork in action.

IDDS 601. Resilience: Models, Research and Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Overview of resilience models and research across the life span in diverse populations. Interdisciplinary emphasis on applying this overview to prevention and intervention programs at individual, family, school, community and societal levels.

IDDS 602. Leadership in Developmental Disabilities. 2 Hours.
Semester course; 2 lecture hours. 2 credits. A team-taught seminar in leadership development with particular emphasis on issues related to children with developmental disabilities.

IDDS 603. Clinical and Community Services for Children with Neurodevelopmental Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Team-taught by faculty from the Leadership Education for Neurodevelopmental Disorders (LEND) program using problem-based learning. Students will learn the interdisciplinary approach to services for children with neurodevelopmental disabilities with an emphasis on evidence-based practices, the medical home and sources of community support.

IDDS 604. Interdisciplinary Studies in Developmental Disabilities: LEND Seminar I. 4 Hours.
Semester course; 3 lecture/seminar hours; 1 online hour. 4 credits. Enrollment restricted to students who have applied to and been accepted as a trainee or fellow in the Va-LEND program. Provides information and activities on models of teamwork, group decision-making, interdisciplinary team process, communication strategies and leadership skills. Focus is on how teamwork and leadership influence services for children with developmental disabilities and their families.

IDDS 605. Interdisciplinary Studies in Developmental Disabilities: LEND Seminar II. 4 Hours.
Semester course; 3 lecture/seminar hours; 1 online hour. 4 credits. Enrollment restricted to students who have applied to and been accepted as a trainee or fellow in the Va-LEND program. Students will learn the interdisciplinary approach to services for children with neurodevelopmental disabilities with an emphasis on research and evidence-based practices, pertinent legislation, the medical home and sources of community support.

IDDS 672. Practicum in Disability Leadership. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be taken for a total of 4 credits. Study and integration of interdisciplinary practice in clinical or off-campus settings. Supervised by interdisciplinary faculty. Includes interdisciplinary clinical practice, family mentorship experience, disability policy activities, leadership project and professional development activities specific to leadership education for developmental disabilities. Trainees will have an opportunity to function as both team members and team leaders in addressing the needs of children with disabilities or other special health care needs and their families.

IDDS 691. Special Topics in Developmental Disabilities. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Prerequisite: Permission of graduate faculty adviser, course faculty coordinator, and director of preservice training at the Virginia Institute for Developmental Disabilities. Explores specific interdisciplinary content and issues in the field of developmental disabilities and examines the practice approaches of multiple disciplines.

IDDS 692. Directed Study in Developmental Disabilities. 1-4 Hours.
Variable hours. 1-4 credits. Prerequisite: Permission of graduate faculty adviser and director of preservice training at the Virginia Institute for Developmental Disabilities. Provides an independent study in a specific area of interdisciplinary practice in developmental disabilities developed under the supervision of a member of the graduate faculty.

Reading (READ)

READ 600. Analysis and Correction of Reading Problems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 561 or permission of instructor. An analysis of factors relating to reading difficulty. Diagnostic testing procedures and instructional strategies appropriate for the reading specialist in clinical and classroom settings will be emphasized.

READ 601. Psycholinguistics and Language Arts Curriculum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An investigation of the psychological processes involved in language behavior and the relationship of these processes to the teaching of the basic communication skills.

READ 602. Literacy for Adults. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of methods, strategies and techniques appropriate for teaching adult readers functioning at levels ranging from beginning to college level. Assessment issues, basic reading concepts, skills, and adult reading methods and materials are analyzed. Focus is on adapting teaching techniques for use with adults in various academic and life settings.

READ 605. Organizing and Implementing Reading Programs. 3 Hours.
3 lecture hours. 3 credits. Prerequisites: TEDU 561, READ 600 and TEDU 672, or permission of instructor. Integrates reading theory with program implementation. Analyzes the role of reading specialist as related to program design, assessment, supervision, instruction, and resource responsibilities. Includes specific field-based requirements.

READ 672. Internship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 12 credits. Prerequisites: READ 600 and TEDU 561. Study and integration of theory with practice in clinical or off-campus settings supervised by an approved professional and university faculty. May include seminars, selected readings, projects and other activities designed and evaluated by supervising faculty.

READ 691. Topics in Reading. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Examines recent trends and topics within the field. Includes review of pertinent research, examination of policy issues and investigation of historical movements. Clinical application is included as appropriate.

READ 700. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Prerequisite: READ 605. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a setting, under supervision of an approved professional. Externship activities monitored and evaluated by university faculty.

Special Education and Disability Policy (SEDP)

SEDP 501. Characteristics of Individuals with Disabilities. 3 Hours.
Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. This course prepares candidates to understand how exceptionalities can interact with multiple domains of human development to influence an individual's learning in home, school, community and throughout life. Candidates will gain an understanding of the characteristics between and among individuals with and without exceptionalities. Course content focuses on the identification and characteristics of individuals with exceptionalities as defined under the Individuals with Disabilities Education Improvement Act. This course also provides information on educational, psychosocial and behavioral interventions that serve as adaptations to the general curriculum and/or home/social expectations. Candidates gain an understanding of the impact of related medical conditions and differentiated evidence-based interventions on the development and learning of young children and/or students with or at risk for disabilities. In addition, candidates gain understanding of child abuse recognition and prevention, with particular focus on issues and strategies unique to working with young children and students with disabilities. Throughout this course, candidates will consider beliefs, traditions and values across and within cultures that influence relationships among and between young children, students and their families. Further, this course will emphasize the importance of interdisciplinary collaboration for promoting the well-being of individuals with exceptionalities across a wide range of settings and collaborators. This course is offered in multiple sections to accommodate specific program requirements across the concentrations offered in the M.Ed. in Special Education.

SEDP 502. Supervision Seminar I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course emphasizes effective techniques to use when working with special education and general education teachers, instructional assistants, parent and students with disabilities. Participants will examine the different roles of the special educator. Class members are encouraged to introduce topics for discussion based on their teaching experiences. Problem-solving strategies will be developed to address the issues raised during class. The course will provide the special educator with an understanding of the Individualized Education Program process from fostering consensus to developing the IEP. Emphasis will be placed on understanding the impact of the student's disability in accessing the general curriculum. Developing a data-driven IEP based on standards will also be emphasized.

SEDP 503. Supervision Seminar II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course emphasizes effective techniques to use when working with special education and general education teachers, instructional assistants, parent and students with disabilities. Participants will examine the different roles of the special educator. Class members are encouraged to introduce topics for discussion based on their teaching experiences. Problem-solving strategies will be developed to address the issues raised during class. The course will provide the special educator with an understanding of how to implement mandates in the classroom as related to the state assessment program. Participants will learn why there is an emphasis on the development of standards-based IEPs and how they are integrated in daily classroom instruction. Participants will also learn about the different SOL participation options and how to use criteria to determine the appropriate option.

SEDP 505. Theory and Practice of Educating Individuals with Special Needs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Not for certification or endorsement in special education. In-depth study of past and current philosophies and approaches to serving students with special needs in educational settings. Attends to specific ways school services and classroom practices of general education teaching can assist in meeting these needs in today's schools through collaboration and inclusion.

SEDP 531. Educational Foundations for Collaboration and Universally Designed Learning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Delivered as online, face-to-face or hybrid course. Focuses on providing candidates with the knowledge of the foundation for educating students with disabilities, as well as the principles and processes for collaboration and consultation with educational colleagues, community professionals and families. Covers the historical, philosophical and sociological foundations underlying the role, development and organization of public education in the U.S. Discussions and readings will focus on creating and maintaining inclusive schools, effective communication strategies for building successful collaborative teams and universally designed instructional strategies to use in co-taught classrooms.

SEDP 532. Understanding Autism Spectrum Disorder. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course presents an introduction to autism spectrum disorder. The course will include a discussion of the core behavioral and secondary characteristics and how they impact the individual across the lifespan, from infancy through adulthood. Family concerns and considerations will be discussed in the context of age, development and need for support. The course will also describe the qualities of intervention strategies and will outline ways to evaluate practices and make sound intervention decisions.

SEDP 533. Assessment of Individuals with Disabilities. 3 Hours.
Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. This course is designed to provide knowledge and practical applications of screening and assessment of young children and students at risk for and with disabilities/delays. Teacher candidates will be prepared to make professional decisions regarding the screening, assessment and ongoing evaluation of young children and students with disabilities. Teacher candidates will gain knowledge of measurement principles and practices to administer assessments and interpret results. This course will emphasize examination of both formal and informal assessments and their use in data-driven decision-making related to educational placement, intervention planning and IEP/IFSP development. This course is offered in multiple sections to accommodate specific program requirements across the concentrations offered in the M.Ed. in Special Education.

SEDP 600. Language/Communication Intervention for Young Children and Individuals with Severe Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. An intensive study of the developmental sequence of language/communication acquisition and intervention strategies for individuals with severe language delays or deficits, severe intellectual disabilities and/or other severe multiple disabilities.

SEDP 601. Instructional Methods and Programming for Individuals with Disabilities. 3 Hours.
Semester course; 3 lecture hours (delivered as online, face-to-face or hybrid course). 3 credits. This course provides the knowledge, skills and methods necessary to plan and deliver effective instruction to individuals with disabilities. Course content is focused on how to collaborate with families and other professionals to deliver instruction that improves the outcomes of young children and students. Teacher candidates will develop skills to plan and deliver instruction in a variety of educational settings and learning environments. This course builds teacher candidates' cultural competence and emphasizes the use of recommended practices and evidence-based interventions to support the social, emotional and/or academic growth of individuals with disabilities. This course is offered in multiple sections to accommodate specific program requirements across the concentrations offered in the M.Ed. in Special Education.

SEDP 602. Methods II: Teaching Students in Special Education - General Education. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Delivered as online, face-to-face or hybrid course. Prerequisites: SEDP 601 and acceptance for teacher preparation if in the M.Ed. program. Provides a study of instructional strategies and organization of activities with focus on elementary and secondary students with high incidence disabilities (in grades K-12) including curriculum, media, materials and physical environment. Candidates will use the foundation from Methods I as a context for developing skills necessary to provide the most effective classroom instruction for secondary students. A continued focus will be on assessing and monitoring student performance, adapting instructional interventions based upon students' response to intervention, and selecting evidence-based practices that have the greatest likelihood of success.

SEDP 603. Theories, Assessment and Practices in Literacy Development for Individuals with Exceptionalities. 3 Hours.
Semester course; 3 lecture hours (delivered as online, face-to-face or hybrid course). 3 credits. This course is designed to prepare teacher candidates to instruct and support individuals with exceptionalities in developing necessary skills for lifelong literacy. Teacher candidates will understand literacy development, including emergent literacy skills, and the impact of disabilities and delays on learning and progress in this domain. This course will emphasize assessment as the basis for designing instruction and interventions. A variety of strategies, methods and supports will be discussed, analyzed and applied to address a variety of reading, language and/or communication needs. This course is offered in multiple sections to accommodate specific program requirements across the concentrations offered in the M.Ed. in Special Education.

SEDP 604. Characteristics of Students With Severe Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students who have been admitted to the Virginia Consortium for Teacher Preparation in Special Education Adapted Curriculum. Examines nature and causes of disabling or special health conditions. Covers screening and evaluation techniques, characteristics and educational implications.

SEDP 610. Teaching Strategies for Students with Severe Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to provide instruction in teaching methods for individuals with severe behavior, learning or emotional disabilities. Emphasis will be placed on instructional program development, task analysis and methods of precision teaching.

SEDP 611. Secondary Education and Transition Planning. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Delivered as online, face-to-face or hybrid course. Explores the literature, research, issues and trends that are relevant to high school-aged students with high incidence disabilities as they prepare for their transition to life after high school. Focus is on providing candidates with the ability to prepare their students and work with their families to promote successful student transitions throughout the educational experience including postsecondary training, employment and independent living that addresses an understanding of long-term planning, career development, life skills, community experiences and resources, self-advocacy and self-determination, guardianship, and legal considerations. The full range of functioning is addressed in the areas of education, employment, social/emotional functioning, personal and daily living issues.

SEDP 612. Assessment and Curriculum for Students with Severe Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Addresses functional assessment strategies, IEP development, and curriculum organization and implementation for students with severe disabilities. Emphasizes educating learners in the least restrictive environment using a transdisciplinary team approach.

SEDP 616. Introduction to Disability Studies, Community Services and Business Networks. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines disability history, theory and current thinking in the field of disability studies. Changes in philosophy, legislation and policy over the past four decades will be examined to trace the paradigm shift that led to our current conceptualization of disability. Students will investigate the community services and resources available to support adults with disabilities, as well as new trends in business partnerships and employment service models that promote the economic self-sufficiency of adults with disabilities.

SEDP 619. Multicultural Perspectives in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to enhance cultural competence in diverse classrooms and schools. Major considerations include race, ethnicity, linguistic, gender, abilities and sexual orientation differences. Key concepts include structural, curricular and instructional facets of working successfully in diverse educational settings. Personal and theoretical constructs of race, ethnicity, culture, disability and other related concepts are explored. This course is delivered online. Crosslisted as: TEDU 619.

SEDP 621. Applied Behavior Analysis: Principals, Procedures and Philosophy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide an overview of the basic principles and procedures of applied behavior analysis. Factors and principles that contribute to improved performance as well as development of interfering behaviors are identified. Further procedures that can be used to minimize interfering behavior, improve performance, teach new behaviors and increase the probability of behaviors occurring under appropriate circumstances are described.

SEDP 622. Ethics and Professional Conduct for Behavior Analysts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: SEDP 621. Provides an overview of the professional conduct standards consistent with the practices of applied behavior analysis and outlines how to provide ethical and responsible behavioral programming. The Virginia Behavior Analyst Licensure law, the Behavior Analyst Certification Board's Guidelines for Responsible Conduct and Disciplinary Standards, as well as the Association for Positive Behavior Supports Standards of Practice are reviewed and used to guide course content. A focus is placed on developing and implementing ethical behavioral programming that promotes the improvement as well as the dignity of the person receiving intervention. Ethical conduct as it relates to colleagues, the field of ABA and society also is discussed.

SEDP 623. Applied Behavior Analysis: Empirical Bases. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: SEDP 621. Provides information on the basic content of applied behavior analysis and how to implement the core principles in real-life situations. Participants will be instructed on how to implement behavioral procedures and develop behavioral programs for individuals who may need to increase positive skills or reduce interfering behavior. Participants also will be instructed on single-subject design, the research methodology used in the field of ABA and its applications in real-life situations.

SEDP 624. Applied Behavior Analysis: Applications. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: SEDP 621. Discusses the various applications of the field of applied behavior analysis and expands the capability to deal with more complex behavioral situations, enabling the ability to relate to more sophisticated professional issues and environments. Specifically, the course demonstrates how ABA is applied in real-world situations to make socially significant changes by minimizing interfering behavior, improving performance, teaching new behaviors and increasing the probability of behaviors occurring under appropriate circumstances. This course also provides a foundation for giving appropriate support to those implementing the behavior plan.

SEDP 625. Applied Behavior Analysis: Assessments and Interventions. 3 Hours.
Semester course. 3 lecture hours. 3 credits. Pre- or corequisite: SEDP 621. Expands on basic content of applied behavior analysis and teaches how to implement behavioral procedures and develop behavioral programs for individuals with fundamental socially relevant behavioral needs. In this course, participants will learn how to implement behavioral assessments, select and develop intervention procedures, and compose instructions for implementation.

SEDP 626. Applied Behavior Analysis: Verbal Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisite: SEDP 621. Further expands the participant's capability to use applied behavior analysis in complex behavioral situations and enables students to apply principles to sophisticated issues through analysis of language development. The course will provide information on verbal behavior and basic verbal operants and how to develop intervention procedures to teach diverse learners.

SEDP 630. Trends in Special Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Includes an overview of legislation and case law pertaining to special education, characteristics of individuals with and without exceptionalities including growth and development from birth though adolescence, mainstreaming, integration/inclusion, transition, and classroom adaptations for educating students with disabilities in least restrictive environments. Candidates will become familiar with the general characteristics of children with and without exceptionalities relative to age, varying levels of severity and developmental differences manifested in cognitive, linguistic, physical, psychomotor, social or emotional functioning.

SEDP 631. Behavior Support of Individuals with Disabilities. 3 Hours.
Semester course; 3 lecture hours (delivered as online, face-to-face or hybrid course). 3 credits. This course will provide an in-depth analysis of theoretical models, research and strategies for supporting positive behaviors of young children and students with exceptionalities. Emphasis is on developing, implementing and/or structuring environments and interventions to encourage adaptive behaviors and the social/emotional development of individuals with exceptionalities, and directly teach them to adapt to the expectations of differing environments. Course content focuses on conducting formal and informal assessments of behavior and environments to individualize and implement strategies to support the growth and development of individuals with exceptionalities. This course will help develop a candidate's ability to examine the behaviors of students with special needs in a variety of settings, including an understanding and application of behavior management techniques and individualized behavioral interventions. Techniques and approaches taught will promote skills that are consistent with developmental milestones and/or standards and rules of a variety of educational environments, and will be diverse based upon developmental, cognitive, behavioral, social and ecological theory and best practice. Candidates will learn to integrate results of assessments to develop long- and shorter-term goals and objectives and integrate these into individualized service and behavior change plans. Focus will also be on how to consult and collaborate with colleagues and families to implement individualized plans across a variety of environments. Candidates will learn to evaluate young children's and/or students' behavior and environments, as well as reflect on their own role in contributing to and mitigating challenging behaviors. Candidates will also learn strategies to prevent and/or intervene safely with children who exhibit challenging behavior, as well as to facilitate positive b ehavior. As part of the course requirements, candidates will also complete approved modules in child abuse and neglect recognition and intervention if not already completed. This course is offered in multiple sections to accommodate specific program requirements across the concentrations offered in the M.Ed. in Special Education.

SEDP 632. Transition Strategies for Students with Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide knowledge of the special educator's role in preparing students with disabilities for post-secondary educational and vocational environments. Emphasis is placed on designing and modifying high school curricula involving students and their families in transition planning and helping students acquire the services needed to be successful in adult life.

SEDP 634. Assessment, Curriculum and Teaching Methods for Autism Spectrum Disorder. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SEDP 532. Students will review assessment techniques and curriculum design, as well as the major methodologies to teach individuals with autism spectrum disorder from early intervention through transition to adult services in inclusive and specialized educational settings. This course will focus on scientifically based interventions that address the communication development and academic needs of the individual with autism spectrum disorder. Participants will be required to demonstrate knowledge of course goals by integrating content with students with autism spectrum disorder.

SEDP 635. Supporting Behavior and Social Skills for Autism Spectrum Disorder. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SEDP 532. Students will review major methodologies needed to create a positive social and emotional learning environment for individuals with autism spectrum disorder from early intervention through transition to adult services in inclusive and specialized educational settings. This course will address the individual's social, behavioral and sensory needs by focusing on the emerging best-practice interventions needed to teach social understanding and shape appropriate social behavior, build play and leisure skills, teach anger and stress management, procure sensory motor modulation, conduct functional behavior assessments, and provide positive behavior support. Participants will be required to demonstrate knowledge of course goals through integration with students with autism spectrum disorder.

SEDP 638. Instructional Design and Field Experience for Autism Spectrum Disorder. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SEDP 532, 634 and 635. Students will focus on the integration of theoretical and practical concepts related to supporting individuals with autism spectrum disorder from early intervention through transition to adult services in educational settings. It provides the opportunity to apply knowledge of assessment, curriculum design, teaching methodologies and environmental and technological supports while working collaboratively with caregivers and educational teams to develop individualized programming. This course has a 20-hour field-based experience that is to take place in an educational setting. The field-based experience will be coordinated with the course instructor.

SEDP 641. Independent Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Prerequisite: permission of instructor. An individual study of a specialized issue or problem in education.

SEDP 651. Topics in Education. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for 9 credits. Check with department for specific prerequisites. A course for the examination of specialized issues, topics, readings or problems in education.

SEDP 658. Educating Students with Physical and Sensory Disabilities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the educational, social, physical, and health care needs of students who possess both cognitive and physical/sensory disabilities. Focuses on specific strategies for positioning and handling students, assessing skills and developing goals collaboratively. Emphasizes techniques for meeting the needs of students with deaf-blindness and students with special health-care needs.

SEDP 700. Externship. 1-6 Hours.
Semester course; 1-6 lecture hours. 1-6 credits. The externship experience for M.Ed. candidates requires the study and integration of theory with practice in a clinical setting supervised by an approved professional and university faculty member. This externship includes planned site visits by the university faculty member (at least four of the visits will be observations of the student in a teaching situation). During the semester-long externship, students are in classrooms with a set amount of hours spent supervised by a fully licensed, experienced teacher in direct teaching activities. Any other externship configuration can only be done with the permission of the severe disabilities program coordinator. The supervision provided emphasizes effective techniques to use when working with special education and general education teachers, instructional assistants, parents and students with disabilities.

SEDP 705. Seminar on Disability Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discussion and examination of key federal and state issues that affect disability policy and program management. Includes an in-depth examination of IDEA, ADA and the Rehabilitation Act of 1973.

SEDP 706. Personnel Development in Special Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prepares individuals to effectively design, provide and evaluate personnel development programs that prepare professionals to maximize the developmental, educational, emotional and employment outcomes of individuals with disabilities.

SEDP 707. Critical Issues in Special Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discussion and examination of controversial and/or critical issues in special education, as well as current IDEA definitions, referral and assessment methods and instructional models.

SEDP 708. Grant Writing in Special Education and Other Social Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines conceptual, empirical and practical issues in the preparation of grant proposals and in the conduct of interdisciplinary research in the social sciences that focuses on education and related issues in youth development, with a specific emphasis on youth with disabilities. Students will develop practical skills in establishing interdisciplinary research teams; interdisciplinary research design and grant proposal development; matching research questions to funding agencies and their priorities; working with community agencies and relevant stakeholders to secure their involvement in the research process; writing research or training grant proposals.

SEDP 709. Literature Reviews in Special Education and Other Social Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides in-depth, advanced instruction in the conducting of systematic literature reviews; instruction in how to create and refine a research question; instruction in defining and refining search terms; instruction in critically analyzing identified literature; and instruction in the writing and structure of a literature review.

SEDP 711. Doctoral Seminar in Single Subject Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is intended to provide an overview of strategies for designing and conducting single subject studies that are relevant to education, special education, psychology and other related fields of inquiry. Its purpose is to provide doctoral students or advanced graduate students who are interested in applied research designs with an opportunity to acquire competencies related to planning, implementing and analyzing such research. The content of the course will focus on applications and interpretations of single-case research designs and the analysis of human behavior in educational and community settings. This course is designed as an initial course in single research design.

SEDP 771. Research Internship. 1-3 Hours.
Semester course; 1-3 research hours. 1-3 credits. May be repeated for a total of 3 credits. Enrollment requires prior approval of adviser. The research internship is designed to provide doctoral students with an opportunity to demonstrate competence at designing and conducting a pilot research study and disseminating research findings. Graded as S/U/F.

SEDP 772. Teaching Internship. 1-3 Hours.
Semester course; 1-3 internship hours. 1-3 credits. Enrollment requires prior approval of adviser. The teaching internship is designed to provide doctoral students with an opportunity to demonstrate competence in the activities related to the preparation of teachers of students with disabilities at the university level. Graded as S/U/F.

SEDP 773. Service/Policy Internship. 1-2 Hours.
Semester course; 1-2 hours of internship. 1-2 credits. Enrollment requires prior approval of adviser. The service competency is met through an internship that is designed to give doctoral candidates an intensive experience in which they can become actively involved in professional service to the field of special education and, in particular, in the development and implementation of local, state or national policy. Graded as S/U/F.

SEDP 890. Dissertation Prospectus Preparation. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: SEDP 709 Students will receive guidance in the preparation of their dissertation prospectus, describing their plan for conducting an original research study as the final requirement for their Ph.D. in Special Education and Disability Policy. Graded S/U/F.

SEDP 899. Dissertation. 1-9 Hours.
Semester course; variable hours. Variable credit. May be repeated. A minimum of 9 semester hours required. Prerequisite: Successful completion of comprehensive examinations and approval of student's doctoral prospectus. Dissertation work under direction of dissertation committee. Graded as S/U/F.

Teacher Education (TEDU)

TEDU 500. Workshop in Education. 1-3 Hours.
Semester course; 1-3 credits. Repeatable to 6 credits. Designed to focus on a single topic within a curriculum area, the workshop offers graduate students exposure to new information strategies and materials in the context of a flexible instructional framework. Activities emphasize a hands-on approach with direct application to the educational setting.

TEDU 501. Supervising Student Teachers. 1-3 Hours.
3 credits. Prerequisite: permission of instructor. Focuses on the role of clinical faculty as site-based supervisors of student teachers. Provides knowledge, skills and training necessary to supervise and evaluate student teachers.

TEDU 503. Guidance for Exceptional Children. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to guidance strategies for assisting exceptional children. Special attention is given to the interrelationships of home, school and community resources.

TEDU 510. Instructional Technology in K-12 Environments. 2 Hours.
Semester course; 2 lecture hours. 2 credits. An introduction to effectively integrating technology into K-12 instruction to improve student learning outcomes. Students will have hands-on experiences with a variety of current instructional technologies and learn how to integrate these technologies into their practice using research-driven theoretical frameworks. This hybrid course includes both online and face-to-face learning activities; it also models technology-rich face-to-face instruction for students as well as hybrid and fully online instructional methods. Students will design technology-rich instructional modules that can be utilized to improve student learning in their content areas, as well as develop personal learning networks that will continue to provide them with informal and independent learning opportunities well after the conclusion of the course.

TEDU 512. Teaching Elementary Health and Physical Education. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to students in general health and physical education who have been admitted to teacher preparation program. Designed to enhance knowledge and advanced pedagogical skills in teaching elementary health and physical education. Through an analysis of the NASPE and AHEE standards, state SOL, goals, objectives and programs, students construct year-round curricula and daily lesson plans for use in public school settings. Emphasis also placed upon classroom management skills and administrative and organizational strategies dealing with facilities, equipment, teaching aids, measurement and safety.

TEDU 513. Teaching Health Education. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to students in general health and physical education who have been admitted to teacher preparation program. Prepares students to become independent problem-solvers and decision-makers by applying previously acquired knowledge to advanced instructional techniques in the public school health classroom. Students acquire advanced pedagogical skills and gain insight into the development of health education programs for middle and secondary schools. Course includes the development of curricula, unit plans and lesson plans.

TEDU 514. Teaching Physical Education. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Restricted to students in general health and physical education who have been admitted to teacher preparation program. Designed to enhance knowledge and advanced pedagogical skills in teaching secondary physical education. Through an analysis of the national standards, state SOL, goals, objectives and programs, students construct year-round curricula, units and daily lesson plans to be used in public schools. Emphasis also placed upon the acquisition of administrative and organizational knowledge dealing with facilities, equipment, teaching aids, measurement and safety.

TEDU 517. Science Education in the Elementary School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 414 and admission to teacher preparation program. Corequisites: TEDU 310 (Practicum B), 522 and 591. A course designed to renew and/or expand teachers' knowledge and skills in the teaching of science in the classroom and the community. New materials and methodologies will be examined in the light of current trends, research findings and professional recommendations.

TEDU 521. Teaching Mathematics for Middle Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Emphasis on current instructional strategies, learning theories and manipulative materials appropriate for teaching mathematics to children. The content focuses on middle grades, but the developmental approach includes some topics from the primary grades.

TEDU 522. Teaching Mathematics for Elementary Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 414 and admission to teacher preparation program or permission of instructor. Corequisites: TEDU 310 (Practicum B), 517 and 591. Emphasis on current instructional strategies, learning theories and manipulative materials appropriate for teaching mathematics to children. The content focus is on the primary and elementary grades.

TEDU 523. Implementing and Administering Programs for Young Children. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides the student with fundamental knowledge and skills in the implementation, supervision and administration of educational programs in schools, centers and homes for infants and young children. A problems approach will be utilized with emphasis on creative management and evaluative processes.

TEDU 524. Cross-cultural Perspectives in Child Rearing and Early Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analysis of the impact of linguistic patterns, child-rearing techniques and socialization processes on the education of young children in various cultural settings.

TEDU 525. Teaching Language Arts. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Teaching techniques and materials for the developmental teaching of communication skills. Students will explore significant research and current literature related to content, organization and instruction in language arts for the elementary and middle schools.

TEDU 526. Word Study. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Integrates the linguistic, historical, theoretical and research bases of developmental spelling and word knowledge (phonics, phonemic awareness and vocabulary). A primary focus is on the stages of spelling development, including assessment and instruction of orthographic knowledge at each stage.

TEDU 528. Children's Literature II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of classic and current children's books from a variety of literary genres. Magazines and media-related reference resources and journals are reviewed. The creative use of literature, its sociocultural functions and its contribution to the development of the oral and written expression of children from nursery to grade eight are explored. A focus on children with special problems is included. May not be taken for credit toward undergraduate English major if student has taken ENGL 351/TEDU 351. May not be used to fulfill literature requirement for M.A. in English or M.F.A. in Creative Writing, but may be taken as elective credit. Crosslisted as: ENGL 528.

TEDU 531. Media Literacy in the K-12 Classroom. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Offered in online and traditional formats. Explores the role of media in society and methods for incorporating media literacy instruction in the K-12 school classroom. Participants will study the foundations of media literacy, critical thinking and the ways media shapes our views of culture, society and education. Through hands-on activities and projects, participants will become familiar with a variety of media tools and instructional methods for utilizing media to support student learning. Participants will research methods for assessing student learning when using paper-based and digital media.

TEDU 535. Problems of Social Studies Instruction. 3-6 Hours.
Semester course; 3-6 credits. Prerequisite: Permission of instructor and appropriate teaching experience. An in-depth investigation into the nature of and alternatives to problems encountered by students while teaching. Developing and evaluating instructional alternatives will be stressed.

TEDU 537. Secondary School Curriculum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Studies the background and objectives of the contemporary secondary school; basic issues, current trends and practices in curriculum construction and instructional planning are examined.

TEDU 540. Teaching Middle and High School Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EDUS 301 and admission to teacher preparation or permission of instructor. Examines the teaching strategies, materials and objectives of the sciences in middle and high schools. Emphasizes the nature of science in science instruction, teaching of experimental design and translating science education research into teaching practices.

TEDU 544. Introduction to the Middle School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of the nature and capabilities of the middle school student, the school environment, teacher characteristics, instructional modes, the curriculum and the future of the middle school movement.

TEDU 545. Teaching Secondary School Mathematics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: upper-division mathematical sciences major or EDUS 301 and admission to teacher preparation or permission of instructor. Examines materials, resources, innovations, procedures, methods, equipment and learning principles appropriate for decision-making related to the teaching of secondary mathematics.

TEDU 547. Teaching Secondary School Social Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines demands involved in secondary social studies instruction; preparatory approaches to using academic and professional insights in confronting the demands; formulating and implementing appropriate methodological approaches.

TEDU 548. Teaching Secondary School English. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EDUS 301 and admission to teacher preparation or permission of instructor. Studies teaching strategies, materials and objectives for literature, language and composition; developing and organizing English instruction; applying learning theory; examining evaluation strategies; questioning techniques; and classroom management.

TEDU 549. Diagnostic Reading in the Secondary School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 561 or 562 or permission of instructor. For prospective and practicing secondary school teachers. Studies diagnostic teaching of reading and techniques to help struggling readers in grades 6 through 12, as well as the role of the secondary reading specialist in reading instruction. Reading levels and selection of appropriate materials are considered. Various techniques and strategies for improving reading are investigated. Emphasis on evaluation of reading progress, differentiation of instruction, reading difficulties, and diagnostic and prescriptive procedures. Course techniques are practiced with students in grades 6 through 12.

TEDU 550. Teaching Interdisciplinary Language Arts and Social Studies in the Middle School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Describes and applies basic principles of middle school education and early adolescence with attention to the persistence of the academic disciplines and traditional curricular approaches to English and social studies. Offers a rationale for interdisciplinary instruction and proposes solutions to the practical dilemmas that confront interdisciplinary teaching in the middle school. Identifies interdisciplinary themes drawn from history, the social sciences and literature; plans units of instruction around such themes; devises instructional strategies for the teaching of interdisciplinary skills and content.

TEDU 552. Teaching English as a Second Language. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students who plan to teach English to people whose native language is not English with a variety of instructional/learning strategies. Presents and explores current approaches and methodology, as these relate to linguistic features and pedagogy. Crosslisted as: ENGL 552/LING 552.

TEDU 554. Applications of Computers in the Teaching of Mathematics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: College calculus course or permission of instructor. Introduction to computers and programming using the language, BASIC. Applications of the computer in algebra, geometry, trigonometry, statistics and calculus.

TEDU 555. Geography in Social Studies Curriculum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A survey of geographic concepts and processes as a basis for examining curricular projects for and developing instructional approaches to geography as part of the social studies curriculum.

TEDU 556. Advanced Computer Applications in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequsites: TEDU 507or its equivalent, a portfolio demonstrating content and skills covered in TEDU 507, or permission of instructor. Develops the technology instructional framework, including teaching strategies, models of instruction and best practices in technology integration; creation of instructional lessons integrating technology by using typical office suite production tools; and connecting theory to practice. Will satisfy most of the ISTE and state technology standards.

TEDU 560. Instructional Strategies Using the Internet. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Emphasizes understanding of informational technology instructional strategies; theoretical underpinnings of constructivism; preparation and assessment of instructional models that include project-based learning, inquiry-based learning, problem-based learning and collaborative learning using resources on the Internet.

TEDU 561. Reading Foundations: Sociological/Psychological Perspectives. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The purpose of this course is to provide a basic understanding of the theories, processes, and methodologies of reading instruction. Multidisciplinary, multicultural aspects of reading instruction are stressed. Topics of particular importance to the classroom teacher are emphasized.

TEDU 562. Reading Instruction in the Content Areas. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prepares teachers to apply skills and methods of reading instruction to content areas in elementary, middle and secondary school curricula. Includes theoretical bases and methodology for incorporating reading skills and strategies within content areas of instruction.

TEDU 564. Teaching the Gifted. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Curriculum development and organization of activities for the gifted at different maturational levels with specific attention given to program content, materials, resources and guidance.

TEDU 566. Diagnosis and Remediation in Reading. 4 Hours.
Semester course; 3 lecture hours and 1 practicum hour. 4 credits. Prerequisite: TEDU 426 or 561. Studies reading problems by focusing on reading diagnosis and correction related to classroom and clinic. Involves evaluating and tutoring individuals with reading difficulties. A supervised practicum is a course component.

TEDU 569. Diagnosis and Remediation in Mathematics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. For classroom and resource teachers working with children whose arithmetic achievement is significantly lower than grade-level placement or expectancy level; designed to remediate learning problems in arithmetic at the child's level and to aid teachers in the sequential development of skills and concepts.

TEDU 575. Intercultural Communication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An experientially oriented seminar for persons preparing for or in careers necessitating intercultural communication among persons of differing cultural and/or national backgrounds. Special attention is given to teachers and other professionals who work with a clientele from Latin America, the Middle East, Asia, Africa and Eastern Europe. American cultural patterns broaden understanding of specific groups and engagement in intercultural communication. Crosslisted as: FRLG 575.

TEDU 588. Classroom Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to assist teachers in becoming effective classroom managers. Emphasis on application of classroom management, motivational and instructional theories. Models of classroom management explored; personal management plans developed.

TEDU 591. Social Studies Education in the Elementary School. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 414 and admission to teacher preparation. Corequisites: TEDU 310, 517 and 522. A course designed to renew and/or expand the knowledge and skills of the classroom teacher in the teaching of social studies. Curriculum emphasis on the development of knowledge, skills, values and attitudes will be examined in the light of professional recommendations, current trends and research findings.

TEDU 594. Topical Seminar. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. A seminar intended for group study by students interested in examining topics, issues or problems related to teaching and learning.

TEDU 602. National Board Certification I and Externship Proposal Development. 3 Hours.
Semester course; 3 credits. Prerequisites: participation in a two-day pre-candidacy workshop and approval of department. Analyze and reflect on teaching practices, study national teaching standards, and develop initial portfolio entries. Development of externship proposal.

TEDU 610. Developing and Critiquing Visual Literacy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Develop skills and evaluate the effectiveness and appropriateness of the use of media. Understand imagery, develop visual communication skills to appropriately represent data, video or text by applying design principles in creating print, as well as non-print, as an instructional resource.

TEDU 611. Critical Investigations in Mathematics Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 521, 522 or 545, or permission of instructor. A critical investigation of current and appropriate learning theories, instructional activities, programs and manipulative materials applicable to mathematics education in the elementary school. This course assumes an overall knowledge of the more prominent techniques and materials used to teach mathematics in elementary and middle schools. Students will undertake in-depth critical studies of alternative curricula, materials and strategies based on experience, learning theory and research findings.

TEDU 615. Curriculum Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A basic graduate course in curriculum development. Curriculum decision making is examined in relation to foundation areas, content areas and current educational trends. Various conceptions of curriculum are explored.

TEDU 617. Instructional Models and the Curriculum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course presents a layered, contextualized approach to curriculum and instruction. Students will consider broad families of instructional models. These models will then be reconsidered in light of current cognitive/psychological theories of learning and broader sociopolitical rationales that situate instruction. Throughout this three-tiered journey, students critically appraise and reappraise their initial understandings of instructional models and create a model of their own.

TEDU 618. Curriculum Construction. 3 Hours.
Semester course; 3-6 lecture hours. 3-6 credits. A study of curriculum problems with special attention given to the organization and preparation of teaching units. The course is individualized to meet student needs and nature of study.

TEDU 619. Multicultural Perspectives in Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to enhance cultural competence in diverse classrooms and schools. Major considerations include race, ethnicity, linguistic, gender, abilities and sexual orientation differences. Key concepts include structural, curricular and instructional facets of working successfully in diverse educational settings. Personal and theoretical constructs of race, ethnicity, culture, disability and other related concepts are explored. This course is delivered online. Crosslisted as: SEDP 619.

TEDU 620. Video Applications in Instruction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 556 and 610 or permission of instructor. Emphasizes the design and instructional strategies used with the production of video resources. Differentiates analog and digital video, importing images, video and sound, editing, previewing, transitions, filters, motion settings, superimposing, titles, special effect options, and exporting video. Students will produce and edit a personalized instructional module using digital video hardware and editing software. Crosslisted as: MASC 681.

TEDU 621. Curriculum Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of curriculum theory, research, and practice for advanced students. The seminar is an opportunity for students to integrate previous course work and professional experiences in curriculum.

TEDU 622. Creative and Cognitive Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EDUS 603. Application of theories of creative and cognitive development in teaching.

TEDU 623. Child Study and Assessment in Early Childhood Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Investigation and application of methods of observing, recording, and interpreting the behavior of young children. Review of criterion and norm-referenced measures for assessing capacities and needs in early childhood education as a baseline for prescribing/providing appropriate activities.

TEDU 624. Early Childhood Education Programs and Policies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A study of Early Childhood Education paradigms including historical, federally funded and current center and home-based programs. A review of legislation, state and federal, that has affected ECE program development.

TEDU 625. Young Child and the Curriculum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Translation of curriculum development principles into appropriate curricular programs for young children. Impact of recent research on these curricula. Consideration of child development as related to planned activities and expected outcomes.

TEDU 626. Home-School Communication and Collaboration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 414 or permission of instructor. Studies the rationale, methods, programs and current research of home-school partnerships, preschool through secondary education.

TEDU 627. Exploring Historical Consciousness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to introduce students interested in the fields of public history and history teaching to the contemporary scholarship on how people become conscious of history in schools and in the culture at large. Two inquiry questions will guide our work: What does it mean to be conscious of history? and How do people learn to understand history?.

TEDU 640. Designing and Managing eLearning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: TEDU 556 or 560, or permission of instructor. Emphasizes identification of appropriate methods of instructional delivery to meet online learner needs, develop online modules and lessons for different virtual learning environments, including team and collaborative projects, and best practices associated with the development of online instruction.

TEDU 641. Independent Study. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Determination of the amount of credit and permission of the instructor and department chair must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in education.

TEDU 642. Instructional Mentoring and Coaching. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to develop skills in mentoring, coaching and observing teachers to improve instruction. Students learn how to build an effective mentoring relationship, select appropriate coaching strategies, collect and analyze data during instruction; provide strategic feedback to teachers using supportive language and behavior; assist teachers in analyzing K-12 student work; employ differentiated instruction; and help teachers set professional goals. Emphasis on developing the knowledge, skills and dispositions necessary to respond to teachers' individual and contextual needs through ongoing examination of classroom practice for the purpose of promoting high achievement for all students.

TEDU 643. Teacher as Change Agent. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to help teachers become more effective leaders by assessing and developing their leadership skills, deepening knowledge about policy, sharpening skills at influencing change and developing action plans and issue portfolios to address educational issues.

TEDU 644. Leadership Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed for teacher leadership as opposed to administrative leadership. Explores practical and theoretical models of leadership across several fields, with an emphasis on teacher leadership. Research examined on meaningful collegiality, the art and science of teaching, and the principles of leadership.

TEDU 647. Educational Technology for School Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an overview of the impact of technology -- particularly Web-based technologies -- on K-12 instruction, from pedagogical considerations and associated tool choices to more pragmatic leadership issues of planning, funding and faculty development. This course is designed for administrators, teacher leaders and other interested professionals who are or intend to be leaders in technology. Crosslisted as: ADMS 647.

TEDU 648. Preparation of Instructional Materials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 507 or permission of instructor. Development of materials for the classroom with an emphasis on determining medium, designing the message, producing the material and evaluating the effect. The design of these materials will be predicated on the learning modes and instructional styles.

TEDU 649. Educational Media: Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 507 or permission of instructor. An analysis of educational media with emphasis on the use of media in instructional design and development of teaching strategies.

TEDU 650. Second Language Acquisition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed for those who plan to work with English language learners in diverse instructional settings. A major focus of this course is analyzing second language acquisition theories and how they apply in classroom settings. In-depth analysis of readings will enhance the students' understanding of second language acquisition and the research related to this field. Students will observe classroom teaching, analyzing the application of SLA theories utilized in the instructional setting. Crosslisted as: LING 650.

TEDU 651. Special Topics in Education. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for 9 credits. Check with department for specific prerequisites. A course for the examination of specialized issues, topics, readings or problems in education.

TEDU 657. Mathematics Education Leadership I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyze and reflect on mathematics instruction in the grades K- 8 classroom with respect to design, teaching and evaluation of mathematical tasks, inquiry based instruction and discourse. Appropriate learning theories, instructional programs and technology are investigated. This course is an introduction to the role of the mathematics specialist and is a core course for preparation as a K-8 mathematics specialist.

TEDU 658. Mathematics Education Leadership II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 657 or permission of instructor. Designed for teachers to build skills, understandings and dispositions necessary for mathematics education leadership roles. Emphasis is on developing and refining coaching and professional development skills, becoming familiar with a body of research within mathematics education, and building one's ability to work within and to lead a school-level mathematics learning community. This is a core course for preparation as a K-8 mathematics specialist.

TEDU 659. Mathematics Education Leadership III. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: TEDU 658 or permission of instructor. Designed to acquaint prospective mathematics specialists with those skills, understandings and dispositions needed to facilitate the lesson study process, create and use formative and summative assessments for diagnosing student mathematical understandings and misunderstandings, and increase communication and formal professional presentation skills to work within and lead a district-level mathematics learning community. This is a core course for preparation as a K-8 mathematics specialist.

TEDU 661. Current Topics in Virtual Teaching. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Students will investigate and critically consider emerging technological tools and their impact on various forms of virtual teaching and learning. Affordances and constraints of emerging technologies will be identified and participants will consider the implications of these technologies on various content areas and pedagogical strategies.

TEDU 662. Foundations of Online Teaching. 3 Hours.
Semester course; 3 lecture hours; 3 credits. This introductory course in online teaching provides participants the opportunity to explore current research in online teaching, standards for course design and facilitation, methods and models, and the latest tools available. Participants will explore multiple learning management systems, as well as discover how to work outside of these systems to design effective learning environments. This course will benefit teachers working in solely online environments as well as those who wish to use elements of online teaching in their face-to-face and hybrid courses.

TEDU 663. Facilitating Digital Communication. 3 Hours.
Semester course; 3 lecture hours; 3 credits. The heart of online courses exists in communication: between instructors and students and among the students themselves. This communication requires strong writing and facilitation skills. This course will provide an overview of research related to online course communication as well as practical application for facilitating communications in online courses. Participants in the course will learn how to develop online discussions, employ a variety of techniques to encourage discussions, utilize a variety of tools to support discussion and moderate online conflict to create a healthy online learning environment. Activities will include analysis of online discussions to identify various discussion techniques, work in small groups to guide discussions and learning, respond to scenarios related to solving online conflict and experiment with Web-based discussion tools.

TEDU 664. Instructional Design of Online Environments. 2 Hours.
Semester course; 2 lecture hours; 2 credits. This course emphasizes a systematic instructional planning for online teaching and was created based on the idea of the technological pedagogical content knowledge model. Students will learn how effectively they can prepare their online teaching through a systematic instructional planning process and the use of effective technology integration for pedagogy around their specific subject matter. Students will explore both basic concepts and applied examples in accordance with each step of the online instructional planning processes.

TEDU 665. Assessment and Evaluation in Online Environments. 1 Hour.
Semester course; 1 lecture hour; 1 credit. Providing in-depth assessment and evaluation in online courses can be one of the most challenging parts of teaching and learning online. How does the instructor provide creative and useful assignments that incorporate Web-based tools and require students to demonstrate their learning in authentic ways? This course will provide an overview of formative and summative assessment techniques as they relate to online teaching and learning and provide participants with opportunities to practice those skills.

TEDU 666. Content Focus Workshop. 1 Hour.
Semester course; 1 workshop hour; 1 credit. Effective technology integration requires an understanding of all aspects of teaching including content, pedagogy and technology. Participants in this course will be introduced to the TPACK model that focuses on the knowledge needed to make effective choices for the use of technology to support content-based instruction. In addition, they will learn about activity types as tools for planning pedagogically sound instruction. Students will practice using the model and the activity types to develop technology enhanced curriculum using the framework.

TEDU 667. Course Development Practicum. 3 Hours.
Semester course; 3 practicum hours; 3 credits. This course provides participants with collaborative support and guidance to effectively utilize the knowledge and skills gained from prerequisite courses in foundations of online teaching, facilitating digital communications, instructional design, and assessment and evaluation. Practicum participants will work with a group of peers and the course instructor to finalize the development of their online course.

TEDU 668. Time and Course Management for Online Learning. 1 Hour.
Semester course; 1 lecture hour; 1 credit. Teaching and learning online makes different demands on both instructors and participants than the traditional face-to-face experience. In particular, working asynchronously means that instructors and participants must learn new ways of communicating -- with both the instructor and other students. One important role of the instructor is to help participants navigate this online learning environment, including developing appropriate time-management skills for discussion participation and assignment completion and managing student expectations related to instructor support and feedback. Participants in this course will develop policies and procedures to use as part of their online courses.

TEDU 669. Online Course Facilitation Practicum. 3 Hours.
Semester course; 3 practicum hours; 3 credits. In this practicum experience, participants will facilitate an online learning course with the guidance of an experienced mentor. The exact details of the experience will be dependent on each participant's situation. Participants will collaboratively work together to reflect on various aspects of the experience to identify best practices, hurdles and other aspects of the experience.

TEDU 672. Internship. 4 Hours.
Semester course; 4 hours. 4 credits. May be repeated for a maximum of 12 credits. Prerequisites: passing scores on Praxis II examination and Virginia Communication and Literacy Assessment and permission of adviser. Study and integration of theory with practice in clinical or off-campus settings supervised by an approved professional and university faculty. May include seminars, selected readings, projects and other activities designed and evaluated by supervising faculty.

TEDU 673. Technology Leadership and Staff Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Admission to IT certificate or master's in curriculum and instruction program, or permission of instructor. Emphasis on professional preparation in educational technology leadership; studies of and experiences with leadership, staff development, and supervisory concepts and skills as they relate to the use of technology in K-12 education. Participation in field experience to observe the use of technology to support instruction required.

TEDU 674. Internship II. 1-6 Hours.
Semester course; full time, eight weeks. 1-6 credits. Prerequisites: passing scores on Praxis II examination and Virginia Communication and Literacy Assessment and permission of adviser. Study and integration of theory with practice in clinical or off-campus settings supervised by an approved professional and university faculty member. May include seminars, selected readings, projects and other activities designed and evaluated by supervising faculty.

TEDU 675. Internship in ESL. 3 Hours.
Semester course; 150 contact hours. 3 credits. Enrollment requires permission of instructor. The ESL internship serves as an integrative application experience. Candidates are expected to implement a planned internship project with English language learners, apply knowledge in their area of focus within the field of ESL/TESOL education and demonstrate their ability to be a critically reflective practitioner. Graded as pass/fail.

TEDU 680. Externship Proposal Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: enrolled in M.I.S. degree, mathematics specialist track; approval of externship goals by faculty specialist. Develops and refines the skills applicable to the preparation of an acceptable draft of an externship proposal.

TEDU 681. Investigations and Trends in Teaching. 1-3 Hours.
Semester course; variable hours. 1 or 3 credits. Early and elementary education students register for 1 credit; secondary education students register for 3 credits. May be repeated for a maximum of 9 credits. A course designed to familiarize teachers and prospective teachers with recent trends and developments in course content, strategies for organizing learning experiences and in presenting course material in their classrooms. Laboratory experience may be incorporated where appropriate.

TEDU 682. Curriculum Development in Science Education. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A course for science teacher-developed curriculum innovations that emphasize the initiation of formal and informal classroom work on current scientific trends, as well as special class work and laboratory programs.

TEDU 683. ESL Assessment and Trends. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides future ESOL teachers with the ESL trends and assessment practices in K-12 settings including specific skills regarding instruction, evaluation, assessment and test construction for English learners. Examines policies that influence assessment and the role of standards in assessment.

TEDU 700. Externship. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 9 credits. Prerequisite: Permission of department. Plan of work designed by extern with prior approval of the offering department. State certification or equivalent may be required for some externships. Off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a setting, under supervision of an approved professional. Externship activities monitored and evaluated by university faculty. Graded P/F.

TEDU 702. National Board Certification II and Externship. 3 Hours.
Semester course; 3 credits. Prerequisite: TEDU 602 with a minimum grade of B. Apply advanced analysis and reflection on teaching practice, culminating in the completion of a portfolio that provides evidence of meeting national teaching standards. Conduct externship.

TEDU 730. Professional Development for Changing Schools. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate standing and TEDU 617. This course cannot be used to meet a requirement for endorsement as a supervisor of instruction in Virginia. Provides educational leaders with the knowledge and skills necessary to design, implement and evaluate professional development programs that focus on instructional improvement within the context of changing schools. Includes the application of various staff development models that are designed to meet the needs of educators at different stages of their careers.

TEDU 731. Instructional Theories and Strategies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: graduate standing and TEDU 617. Provides instructional leaders with the knowledge and competence necessary to apply and evaluate instructional strategies that are appropriate for students at all levels of schooling. The focus of the course will be on case studies, applications of principles, use of simulation and practical problem-solving approaches.

TEDU 732. Advanced Seminar in Curriculum Studies. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Completion of TEDU 617 is recommended prior to enrollment. Designed to engage doctoral students in a range of readings, writings, discussions and other experiences that address the questions: What should be taught in schools? and Why? The course builds on earlier course work that examines curricular movements and frameworks, and considers contemporary approaches to curriculum study and the implications and effects of their epistemic and philosophical stances -- regarding the nature of knowledge, learners, schools and society -- on instruction.

TEDU 798. Thesis. 1-6 Hours.
Semester course; 1-6 credits. May be repeated for a maximum of 6 credits. A research study of a topic or problem approved by the student's supervisory committee and completed in accordance with acceptable standards for thesis writing.

L. Douglas Wilder School of Government and Public Affairs

Criminal Justice (CRJS)

CRJS 501. Principles of Criminal Justice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Survey of the American criminal justice system, and the relationships among crime, law, police, courts and corrections. Review of contemporary criminal justice literature.

CRJS 550. Professional Ethics and Liability. 3 Hours.
3 credits. The ethical basis for decision-making in criminal justice. How ethical considerations affect every important decision in criminal justice, especially as they involve the liberty interests of others. These decisions include: police stop and arrest decisions, prosecutor charging decision, defendant plea decisions, defense strategy decisions, judicial evidentiary rulings, sentencing decisions, among others. The consequences of unethical decisions on management ability, civil and criminal liability faced by criminal justice professionals.

CRJS 591. Topic Seminar. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 6 credits. Periodic seminar in contemporary criminal justice topics. Topics to be determined.

CRJS 612. Criminal Justice Politics and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Assesses political and public policy issues as they relate to the administration of justice planning and policy strategies. Emphasizes planning implications of interagency relationships, the impact of social change in the criminal justice process, and community involvement in the control and prevention of crime.

CRJS 616. Justice Policy and Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Analyzes the legal, philosophical, political and management influences that shape the criminal justice policy and its administration. Organization and management principles as they apply to the justice system with emphasis on leadership and human resource development.

CRJS 617. Law and Criminal Justice Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to graduate students. Analysis of intergovernmental relations and civil society in the forming and implementing of criminal justice policies, laws and procedures. The bases for the creation of laws, how they are enforced, applied by the courts and sanctioned will each be examined to evaluate the proficiency of law and the justice process as instruments of social control. The issues of race, class, gender and power will be explored in the passage and implementation of laws with a view toward developing more effective strategies in the planning and development of law and crime policy.

CRJS 620. Seminar in Criminology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination and analysis of social, psychological, and economic theories and correlates of criminal behavior. Typologies of offenders. Crosslisted as: SOCY 620.

CRJS 622. Comparative Criminal Justice Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of crime, law and criminal justice from an international perspective, emphasizing their comparative aspects.

CRJS 623. Research Methods for Government and Public Affairs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduction to the scope and methods of applied research for the public sector. Focuses on problem structuring through logical methods, exploring problems through observation and other methods of data collection, analyzing and summarizing findings using both qualitative and quantitative methods. Crosslisted as: GVPA 623/PADM 623/URSP 623.

CRJS 624. Problems in Policing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires graduate status. Intended to provide an overview of the causes, nature and potential solutions to many of the most significant problems in modern American law enforcement. Problems include issues related to excessive force, corruption, police pursuit and other areas of police discretion.

CRJS 631. Criminal Justice Management and Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Application of organizational theory and administrative behavior to criminal justice policy, management and operation. Administrative concepts, program planning and development, and innovative management practices.

CRJS 641. Jurisprudence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the theoretical underpinnings of law and justice. Studies the evolution of theories of jurisprudence within the context of evolving concepts of responsibility and law. Systems of law will be contrasted and emphasis will be placed on contemporary developments in substantive laws.

CRJS 660. Seminar in Legal Process. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Studies the formal and informal procedures of various criminal justice systems. Advanced study of criminal procedure and the major legal constraints and authorizations placed upon arrest, prosecution, trial, sentencing and appeal.

CRJS 680. Forensic Psychiatry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Guilty mind requirements in criminal law. Competency to stand trial, insanity defense, mental disorder and crime. Behavioral profiling of serial murders and sex offenders. Issues in the use of clinical and statistical prediction methods in criminal justice. Crosslisted as: FRSC 680.

CRJS 690. Criminal Justice Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: CRJS 501, CRJS 617, CRJS/SOCY 620 and CRJS/GVPA/PADM/URSP 623. Enrollment restricted to graduate students. Integration of knowledge of criminological theory and justice policy with the research skills acquired while working toward completion of the graduate degree. Successful completion of this course requires the formulation of a research question that addresses a problem of criminal justice policy, the conceptualization of the scope of the answer to the research question and the submission of an in-depth analysis of the question with reference to theory, methodology and policy.

CRJS 691. Special Topics in Criminal Justice and Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated with different topics. Enrollment requires graduate status. Periodic seminar in contemporary criminal justice or policy topics. Topics to be determined.

CRJS 692. Directed Independent Study. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 6 credits. The instructor's review and approval of the study proposal must precede independent work by student. Provides an opportunity for an advanced student to pursue an independent research project or extensive literature review under the supervision of an instructor.

CRJS 693. Internship. 3 Hours.
Semester course; 3 credits. Students must apply for this internship a semester in advance. Provides student an opportunity to relate theory to practice through observation and experience in an approved agency. The internship should be taken near the end of the degree program. Graded as pass/fail.

CRJS 763. Seminar in Social Justice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines the philosophical and historical underpinnings of the principles of justice and their relationship to equality, liberty, government and law.

CRJS 798. Thesis Research. 1,3 Hour.
Semester course; 3 credits with 1 credit extension. Prerequisite: CRJS 601; a graduate statistics course is strongly recommended. Permission of graduate instructor. Registration for this course is permitted only upon approval of the candidate's detailed research proposal and statement of qualifications reviewed a semester in advance by a faculty committee. A two-semester project resulting in an advanced research paper that involves a comprehensive literature review, approved research design, and an original analysis or replication study. CRJS 798 involves preparation and oral defense of the thesis prospectus. Graded as S/U/F.

CRJS 799. Thesis. 1-3 Hours.
Semester course; 1-3 credits. Prerequisite: completion of CRJS 798. Execution of the research prospectus approved in CRJS 798. The master's thesis will be written according to university guidelines, approved by the student's faculty committee and defended orally before the faculty committee. Graded as S/U/F.

Government and Public Affairs (GVPA)

GVPA 591. Special Topics in Government and Public Affairs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An intensive focus on a specialized subject area relevant to graduate programs in the L. Douglas Wilder School of Government and Public Affairs. See the Schedule of Classes for specific topics to be offered each semester. Also open to graduate students in programs outside of the Wilder School with permission of the instructor.

GVPA 601. Principles of Public Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Dynamics of governmental administration including administrative principles, decision-making, communication, leadership, organizational models, and the social, economic, legal and political milieu of administration. Crosslisted as: PADM 601.

GVPA 623. Research Methods for Government and Public Affairs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduction to the scope and methods of applied research for the public sector. Focuses on problem structuring through logical methods, exploring problems through observation and other methods of data collection, analyzing and summarizing findings using both qualitative and quantitative methods. Crosslisted as: URSP 623/PADM 623/CRJS 623.

GVPA 625. Public Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The examination of various methods for identifying and structuring public policy problems and issues, formulating and analyzing alternative responses, recommending policy actions for decision-making, and designing and evaluating implementation plans and the means to monitor and evaluate the resulting policy outcomes. Crosslisted as: PADM 625.

GVPA 632. Planning Theory and Processes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines major traditions in the theory of planning in the context of actual planning processes and outcomes. Explores in depth the political, economic, and institutional constraints to effective planning and plan implementation. Discusses the planners' ethical dilemmas. Crosslisted as: URSP 632.

GVPA 635. Theorizing Gender Violence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Teaches students to think structurally about gender and violence. Familiarizes students with social science and feminist scholarship and explanatory theories related to preventing and responding to gender violence. Students will learn about the experiences of and responses to sexual and domestic violence in specific social contexts, with a focus on less visible and underserved populations. Guest lectures provided by community experts in these areas. Also examines social policy and research implications of various approaches.

GVPA 640. River Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines public policy related to rivers and watersheds. Uses the James River for exploring and illustrating generic river policy issues. Crosslisted as: ENVS 640.

GVPA 672. Social Equity and Public Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide an overview of the concept of social equity and its relationship to public policy. A survey course that will introduce students to an array of public policy areas along the core dimensions of race, ethnicity, gender and class.

GVPA 683. Administrative Ethics. 2,3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. A philosophical investigation into the problems of making ethical decisions, focusing on issues likely to confront the public administrator. Examples of such issues are equity in social services delivery, affirmative action, loyalty to the bureaucracy vs. "whistle blowing," and conflicts of interest between personal and public interest. Crosslisted as: PADM 683/PHIL 683.

GVPA 691. Special Topics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An intensive focus on a specialized subject area relevant to graduate programs in the L. Douglas Wilder School of Government and Public Affairs. Also open to graduate students in programs outside of the Wilder School, with permission of the instructor. See the Schedule of Classes for specific topics to be offered each semester.

GVPA 693. Internship. 1-9 Hours.
Semester course; 1-9 hours. 1-9 credits. Permission of instructor required. A graduate-level internship that allows students to explore professional opportunities that relate to one or more of the graduate programs in the Wilder School. See graduate coordinator for specific hour requirements.

Homeland Security and Emergency Preparedness (HSEP)

HSEP 501. Institutional Challenges of Security Preparedness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A detailed examination of the post-9/11 institutional transformation within the U.S. Both the theoretical and practical aspects of the new environment of homeland security and emergency preparedness are examined in the context of local, state and federal government, as well as the private and nonprofit sectors. The dilemmas of coordination, collaboration, competition and decision-making across and within governmental levels and between government and other sectors are explored.

HSEP 502. Survey of Terrorism. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to the theoretical and practical aspects of terrorism and counter-terrorism. Provides a broad overview of the general use of terrorism as a political tool and the idiosyncratic strategies and tactics used by specific terrorist groups. Focuses upon the relationships between terrorism and religion, technology, globalization and organizational design (network organizations). The counter-terrorism policies of various nations are examined in terms of strategic purpose, implementation and success.

HSEP 601. Emergency Management: Response Planning and Incident Command. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An advanced analytical examination of emergency management, including mitigation (designing programs to reduce the risk to vulnerable targets/infrastructure), preparedness (response planning and training, particularly interagency and intergovernmental agreements on joint operations and burden sharing), response (actual operations during and after a terrorist attack or natural disaster) and recovery (maintaining services in the immediate aftermath of a disaster and the long term). Through discussions of theory and numerous case studies, students will be able to identify and investigate the strengths and weaknesses of the current practice of emergency management in the U.S.

HSEP 602. Government, Industry and Community Strategic Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of the guiding principles of strategic planning and the manner in which strategic plans can be used to better identify resource requirements and a prioritized acquisition process. Analyzes the strategic planning goal of designing a coordinated and unified effort that is all inclusive of the multiple agencies (governmental and nonprofit), distinct communities and private industries that have a role in and are impacted by natural disasters or terrorist incidents.

HSEP 603. Risk Assessment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to the assessment and management of risk. Focuses on analytical techniques that assess risk; the primary application will be threats to critical infrastructure. Students will learn to conduct a risk and vulnerability analysis of a specific target, ciy or region using various assessment techniques and to manage that risk by assessing the efficacy of both prevention and response measures. The techniques covered will be both quantitative and qualitative.

HSEP 610. Law Enforcement Policy and Judicial Precedent. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of local, state and federal law enforcement agencies' evolving policies on crisis and consequence management, as well as court decisions guiding these policies and interpreting their implementation. Students will engage in case-study analysis while learning the fundamentals of policy development. Course content will include analysis and discussion of relevant statutes and court cases, and the issues, processes and procedures associated with the development and implementation of judicial policies that attempt to balance civil rights and homeland security, as well as legal aspects of natural disasters and public health crises.

HSEP 620. Private Sector Issues in Security and Preparedness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A survey of the private sector's dilemmas and responsibilities in homeland security and emergency preparedness. Class will focus on issues such as the crictical emergency management functions for private industry (resumption, recovery, restoration, continuity); the question of "how much security is enough"; and the central dilemma of private sector-public sector security and preparedness: the overwhelming majority of critical infrastructure is privately owned, yet it is the government's responsibility to prepare, protect and reconstitute it. Information sharing, communications and regulatory issues are examined.

HSEP 628. Survey of Cyber Security. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course offers a survey of emerging strategic, legal and policy issues associated with computer network attack, exploitation and defense. Students will be introduced to research and developments across a range of issues and will engage with topics related to national security, homeland security and economic policy, and local governance. This course is designed to provide students with perspective on different technical, theoretical and policy issues and to enhance knowledge of cyber conflict conducted by both state and non-state actors.

HSEP 650. Public Health Preparedness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of the role of the public health sector in preparing for and responding to natural disasters, emerging infectious diseases, catastrophic terrorism and bioterrorism. The class focuses on coordination and cooperation of federal, state and local government and the public-, private- and nonprofit-sector components of the public health infrastructure. Topics include epidemiological and mental health issues related to disasters, command/communication concerns, national stockpile management, surge planning, all-hazard planning and exercise design.

HSEP 690. Capstone Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: 27 credits in HSEP courses or permission of instructor. A capstone and assessment course. Readings, writing assignments and the large research project are designed to allow students to use the sum of their knowledge and analytical skills to examine homeland security and emergency preparedness in a broad and comprehensive way. Students will engage in research linked to a role-playing simulation/exercise that will be held when the class meets in the last week of the semester.

HSEP 691. Special Topics in Homeland Security and Emergency Preparedness. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated with different topics. Enrollment requires graduate status. Periodic seminar in contemporary homeland security and emergency preparedness topics. Topics to be determined.

HSEP 692. Independent Study. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. The instructor's review and approval of the study proposal must precede independent work by student. Provides an opportunity for an advanced student to pursue an independent research project or extensive literature review under the supervision of an instructor.

Policy and Leadership (DPAL)

DPAL 701. Cross Sector Leadership. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. Concepts of leadership have largely emerged from the study of people in positions of authority in business and politics whose characteristics, behaviors and values tend to dominate leadership theory. Less well-developed are concepts of public leadership, though its failures have dire consequences. More recently, scholars have turned to the study of civic leadership, which recognizes the benefits and challenges of civic action in shaping action based on shared goals. The course will explore the benefits and challenges of citizens and institutions (government, nonprofit and business) working together to advance sustainable communities.

DPAL 702. Web Technologies and Digital Governance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. This course emphasizes the importance of Web 2.0 technologies and digital governance. Students will learn about the nature of Web 2.0 technologies and their impacts on public policy and administration as well as how Web 2.0 applications can support the goals of government organizations.

DPAL 711. Theory and the Public Process. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. Applying a broad theoretical lens, students will critically examine issues surrounding an actual policy or leadership problem within a chosen concentration. Emphasis is placed upon critical analysis, developing a substantive level of knowledge within an existing literature, and developing and supporting an argument grounded in theory.

DPAL 712. Institutions and Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. Organizational and institutional theories look to the political, organizational and cultural contexts that shape social life. Some theories conceptualize environments in terms of networks and resources, within which social actors are "embedded." Others stress historically built-up structures (e.g., laws and governmental agencies) that shape and channel subsequent dynamics. More radical theories argue that the core features of modern social actors, themselves, are largely products of social constructs, rather than existing a priori as often assumed. This course explores theories of institutions and organizations to inform our thinking about the roles and behavior of public and nonprofit organizations in shaping democratic organizational life in societies.

DPAL 721. Systematic Inquiry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. This course is designed to teach students how to design and assess research in the policy setting. The course focuses on problem structuring through logical methods, exploring problems through multiple methods of data collection, analysis and summarization of findings using qualitative, quantitative and mixed-method designs. Through interpretation and critique of various research reports students gain an understanding of the different purposes that research can serve in applied policy settings.

DPAL 722. Methods of Decision-making. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. This course examines qualitative, quantitative and mixed-methods approaches to decision-making with an emphasis on situation factors impacting the decision-maker. Students will be able to describe, understand, evaluate, apply and create synergistic methods for making decisions.

DPAL 780. Synthesizing Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students. Policy is frequently a bridge between political aspiration and practice. Focuses on studies, reports, research and public initiatives demonstrating the cycle of "idea" to "implementation." The Massengill Report (Virginia Tech tragedy), Richmond mayor's anti-poverty task force and meals tax referenda are examples of case studies that could be reviewed.

DPAL 890. Capstone. 6 Hours.
Semester course; 6 lecture hours. 6 credits. Restricted to doctoral students. Advanced doctoral students will design a capstone project with the advice and under the supervision of selected faculty. The doctoral student is expected to develop a formal proposal designed to respond to a current problem situation relevant to policy and leadership in governance. Once the proposal is approved, the student is to carry out a regimen of research and project development based in professional practice and seeking an innovative solution or model to advance the practice of their chosen concentration.

Public Administration (PADM)

PADM 583. Effective Managerial Communications. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Describes and explains the communications process as it applies in public organizations. Acquaints students with the theoretical basis of interpersonal communications and with applied methodologies from a managerial perspective.

PADM 584. Planned Organizational Change. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Describes and explains strategies and tactics of planned organizational change. Emphasis is placed on the change process in organized situations and on various strategies and tactics the manager may employ to achieve desired change in his or her organization.

PADM 585. Power, Influence and Organizational Competence. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course will explore the strategies and tactics of power and influence use in large-scale public organizations. A framework for use of influence strategies will be presented and tactical methodologies will be examined through case study and simulation.

PADM 591. Topic Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Seminar in contemporary public administration issues.

PADM 601. Principles of Public Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Dynamics of governmental administration including administrative principles, decision-making, communication, leadership, organizational models, and the social, economic, legal and political milieu of administration. Crosslisted as: GVPA 601.

PADM 602. Public Administration Theory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines historical and contemporary public administration theories and paradigms. Emphasizes the practical significance of such theories for both macro and micro issues in public administration.

PADM 603. Politics and Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines political and economic institutions and concepts as they affect and are affected by the practice of public administration. Topics include microeconomics and the public sector; the interrelationship between the private and public sectors; macroeconomics concepts and related institutions.

PADM 604. Comparative Public Institutions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Applies a comparative methodology to explore theories and models of public institutions in the United States and in selected developed and developing countries. Focuses on administrative structures and practices, with emphasis on the relationship between administrative practice and cultural and political context. Institutions examined will be changed periodically to focus on interjurisdictional comparisons within the United States - at the local, state and federal levels - as well as among other countries and the United States.

PADM 605. Survey Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SOCY 601, SOCY 602 and SOCY/STAT 608, or permission of instructor. Examines all major areas of survey research methodology including sampling, design, data collection methods, questionnaire design, data analysis and data processing. Addresses problems specific to survey research, such as telephone interviewing, constructing large representative samples and nonresponse rates. Crosslisted as: SOCY 605.

PADM 606. Government Management Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An examination of current thought and research on management theory and organizational design in government. Theory and research from diverse sources, i.e., political science, sociology, industrial psychology and administrative science will be explored to provide each student with the macro conceptual framework necessary for development or refinement of effective public management skills.

PADM 607. Public Human Resource Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The general concepts, principles, and techniques of personnel administration and employee relations as applied in governmental units and agencies.

PADM 609. Financial Management in Government. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The general concepts, principles and techniques of financial management as they are applied in governmental units and agencies. Students specializing in nonprofit organizations may substitute PADM 659 for this core course.

PADM 621. Organizational Behavior and Management in Government. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The general concepts, principles, and theories of management and organizational behavior as they relate to the administration of governmental units and agencies are dealt with in lecture, discussion and workshop formats.

PADM 622. Public Sector Budgeting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PADM 609. Advanced theory and practice of public agency budgeting in the decision-making process and its impact on policy-making. Topics include alternative budgeting systems, capital planning and budgeting, budget execution, budgeting analysis techniques, and revenue and expenditure forecasting.

PADM 623. Research Methods for Government and Public Affairs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduction to the scope and methods of applied research for the public sector. Focuses on problem structuring through logical methods, exploring problems through observation and other methods of data collection, analyzing and summarizing findings using both qualitative and quantitative methods. Crosslisted as: GVPA 623/CRJS 623/URSP 623.

PADM 624. Quantitative Methods for Public Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PADM 623 or permission of the instructor. Introduction to statistical methods for use in managerial decision-making, policy analysis and social science research. Descriptive and inferential statistics are explored through computations and using SPSS/PC computer software.

PADM 625. Public Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The examination of various methods for identifying and structuring public policy problems and issues, formulating and analyzing alternative responses, recommending policy actions for decision-making, and designing and evaluating implementation plans and the means to monitor and evaluate the resulting policy outcomes. Crosslisted as: GVPA 625.

PADM 626. Intergovernmental Relations. 3 Hours.
3 lecture hours. 3 credits. Focuses on various models of federalism and examines the pragmatic evolution of federal, state and local intergovernmental relations in the United States. Topics include policy implementation and implications, fiscal transfers, and local government cooperation and conflict in the metropolis.

PADM 627. Workshop in Policy Analysis and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PADM 624 and PADM 625, or permission of the instructor. This course is project-oriented, emphasizing practical experience in the design and conduct of policy analysis or program evaluation studies. Emphasizes political environment and client relationships.

PADM 628. Environmental Policy and Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course explores the relationship between environmental policy and its implementation within a democratic political system. It includes an investigation of basic concepts that underlie environmental policy and the difficulties encountered when attempting to apply them in a real-world setting. It also surveys a variety of tools and methodologies that may be useful in attempting to develop and implement environmental policy. Crosslisted as: ENVS 628.

PADM 630. Strategic Planning and Management in the Public Sector. 3 Hours.
3 lecture hours. 3 credits. Explores the benefits and limitations of strategic planning and management in the public sector, examines approaches to strategic management, especially in terms of the role and behavior of top management, and provides an introduction to the analytic and process methods used in strategic planning and management. Crosslisted as: URSP 630.

PADM 637. Organic Human Resources Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PADM 607 or equivalent. An examination of current thought, research, and personnel management theory and practice in government that is person-oriented is presented in this course. Topics include rank-in-the-person personnel systems; career development, executive personnel systems; forecasting human resource needs; individual-based performance evaluation; employee assistance programs; and special emphasis program.

PADM 642. Grants Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Principles and practices of managing federal and state funds and implementing a grant-funded program. Topics include federal grant-making process, applying for a grant, developing grant accounting systems, joint funding, disputes, appeals and remedies, and close-out procedures.

PADM 650. Principles of Nonprofit Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the history, theories and dynamics of not-for-profit organizations in the United States, with focus on organizations with local or regional services areas. Emphasizes political, legal, cultural and constituent environments; revenue generation; decision-making, communications leadership; and organizational models. Compares the mission and operations of nonprofit organizations, government organizations, and for-profit enterprises in the delivery of services.

PADM 652. Administrative Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course considers the administrative process from the perspective of rule-making and decision-making within the framework of public agencies. It will examine the development of the law, the use and control over administrative discretion, legislative and judicial controls over the administrative process, and remedies for improper administrative acts.

PADM 654. Program Design and Evaluation in the Nonprofit Sector. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PADM 623 and PADM 624, or permission of instructor. Designed to train students of nonprofit administration and management in the principles of program design and evaluation. Students will be introduced to the theoretical, organizational, political and ethical foundations of the program as well as practical research design and methodologies, both qualitative and quantitative.

PADM 656. Fund Development for the Nonprofit Sector. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students will study the multiple methods and sources for funding nonprofit organizations, the various methods for identifying and securing funding resources and for differentiating among them. Sources of funding that will be explored include corporate, annual, planned giving/endowment, individual, major gift, the use of special events and direct mail. Grant writing will be explored in detail. Students will examine ethical issues related to fund raising as well as the stewardship of funds received.

PADM 657. Nonprofit Advocacy and Government Relations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Addresses the growth and expansion of the nonprofit sector's relationship to the government sector both in the United States and internationally. Students will study historical and current partnerships with and regulation by government entities. Students also will study the nonprofit organization's advocacy role on behalf of its missions and beneficiaries, the scope of permitted lobbying and political activities, the state's role in regulating speech by nonprofits and government funding of service delivery through religious-based organizations.

PADM 659. Financial Management for Nonprofit Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to introduce students to the financial practices of nonprofit organizations including budgeting, forecasting, accounting, auditing, and debt and cash management. The general concepts, principles and techniques of financial management will be studied in the context of the political, behavioral and social environments in which the nonprofit organization operates in order to determine the best manner for achieving the objectives of the nonprofit financial administrator/manager. This course may be substituted for the core course, PADM 609 Financial Management in Government, for students pursuing a nonprofit specialization.

PADM 660. Community Power Dynamics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examination of the location of power in the American community, operational concepts and general methodological approaches defined, empirical findings based on various methodological approaches, conclusions on community political systems and power.

PADM 661. Nonprofit Law, Governance and Ethics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines fundamental governance issues in nonprofit corporations with a focus on boards of trustees and their fiduciary responsibilities as established by law as well as moral imperatives stemming from their actions on behalf of the public interest. The ethical dimensions of work in nonprofit organizations are explored with specific emphasis on risk management, tax liability and human resource management.

PADM 662. Advanced Topics in Revenue and Taxation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 616 or permission of instructor. An advanced examination of governmental revenue and taxation policies, tax incidence, and alternative funding techniques.

PADM 664. Local Government Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An intensive examination of the major functional responsibilities with a special emphasis on the organization, standards, operational imperatives, interrelationship with other functions, and special management problems at the local level, including small and rural jurisdictions.

PADM 670. Advanced Public Financial Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PADM 609 and ECON 616, or permission of department. Brings together specialty aspects of public financial management such as economic and political implications, practical skill-building, operational financial administration issues and tactics, and accounting principles and approaches, and integrates these disparate segments of public finance. The emphasis is on policy-level implications and strategies of public financial management strategies of executive planning, analysis, and management of the financial sector of public organizations.

PADM 675. Comparative Public Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores methodology, theories and models used in comparative approach to public administration, functional processes of administration in selected developing and developed countries, and role of bureaucracy in development and nation building.

PADM 680. Executive Leadership Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores aspects of current interest in leadership style, skills and roles. This course allows participants to explore areas of personal interest in contemporary public management leadership theory and practice and to share findings in seminar format.

PADM 681. Governmental Administrative Decision-making Processes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Identification of alternative decision-making processes in public sector management environments. Choosing the proper method of the appropriate management-level theory and method of controlling administrative decisions within governmental organizations. Dealing with political, budgetary and personal constraints in achieving organizational goals.

PADM 682. Advanced Public Human Resources Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PADM 607 or equivalent or permission of instructor. Public personnel management is analyzed in process and systems perspectives, with specific emphasis on the interrelatedness of discrete system components with other systems. Attention is given to the integration of personnel elements through the development of feedback systems, positive and negative impacts' analyses, and personnel policy development and implementation.

PADM 683. Administrative Ethics. 2,3 Hours.
Semester course; 2 or 3 lecture hours. 2 or 3 credits. A philosophical investigation into the problems of making ethical decisions, focusing on issues likely to confront the public administrator. Examples of such issues are equity in social services delivery, affirmative action, loyalty to the bureaucracy vs. "whistle blowing," and conflicts of interest between personal and public interest. Crosslisted as: PHIL 683/GVPA 683.

PADM 689. Seminar in Public Administration: Integration of Theory and Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: 24 credits in public administration or permission of instructor. Integration of public management and administration theory and practice; goal setting for professional growth and approaches to lifelong continuing self-development; integration of theory, models, knowledge, skills, behaviors, values, ethics, and philosophy of public management and administration. This is a capstone, required course for M.P.A. students.

PADM 691. Topics in Public Administration. 1-3 Hours.
Semester course; 1, 2 or 3 lecture hours. Variable credit. Course may be repeated with different topics as approved. Prerequisite: permission of instructor. An in-depth study of a selected topic in public administration. See the Schedule of Classes for specific topics to be offered each semester.

PADM 693. Public Administration Practicum. 3 Hours.
3 credits. A professional internship in public service for those students without significant professional-level experience in a public agency.

PADM 697. Directed Research in Public Administration. 1-6 Hours.
Semester course; 1-6 credits. Prerequisite: permission of instructor. Independent research into public administration problems, issues, applications and theories related to student's field of concentration.

Public Policy and Administration (PPAD)

PPAD 711. Seminar in Public Policy I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students only. Provides a critical and comparative review of public policy and administration focusing on the empirical and theoretical literature in the field. Emphasizes the development of the policy studies field and its epistemological foundations. Includes alternative approaches to policy analysis, the place of analysis in the decision-making environment and the role of policy in shaping administrative institutions.

PPAD 712. Seminar in Public Policy II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students only. This seminar aims to facilitate examination of public policy in its macro context. It will assist participants in gaining an overview of fundamental and contextual features of public policy as it has evolved. It will explore underlying and outlying perspectives that shape thinking and theorizing and action about public policy, and that suggest fresh ideas about public policy. This will include selected aspects of philosophy of public policy, philosophy of methodology relating to public policy and epistemic pluralism as it relates to public policy. Continuation of PPAD 711.

PPAD 715. U.S. Political Processes and Institutions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course examines the operation of the major national political institutions in the United States, the processes that help to define and shape those institutions, and the contexts in which these entities operate. The course familiarizes students with a broad range of scholarship and with the principal theoretical debates about U.S. politics.

PPAD 716. Public Policy Economics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to introduce students to a set of applied microeconomic models that can be used to understand and evaluate important policy issues. Students will be shown how these models can be used as tools to design, to predict the effects of and to evaluate public policies. Specific models used in this course will include consumer theory, production theory, cost theory and the theory of economic organization. Discussions of policy analysis and evaluation will rely upon theoretical approaches to welfare economics.

PPAD 717. Law and Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An introduction to basic legal and constitutional issues that shape and limit the creation of public policy. An examination of court cases leads the student to examine the interaction between legislative policymakers, courts and administrative implementers, and how the law may be used both to support the role of policymakers as well as to constrain them. Issues to be examined include health care, regulation of commerce, First Amendment issues, the environment and educational policy.

PPAD 720. Public Organization Design and Behavior. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to doctoral students only. Provides an intensive examination of the public (and nonprofit) organization design and behavior literature. Students will review theories, models and latest research findings as vehicles for understanding behavior in and the design of effective public organizations.

PPAD 721. Survey of Applied Research Methods in Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students only. Provides a critical and comparative review of public policy and administration focusing on the empirical and theoretical literature in the field. Emphasizes the development of the policy studies field and its epistemological foundations. Includes alternative approaches to policy analysis, the place of analysis in the decision-making environment and the role of policy in shaping administrative institutions.

PPAD 722. Survey of Data Analysis Techniques in Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to doctoral students only. Provides a critical and comparative review of public policy and administration focusing on the empirical and theoretical literature in the field. Emphasizes the development of the policy studies field and its epistemological foundations. Includes alternative approaches to policy analysis, the place of analysis in the decision-making environment and the role of policy in shaping administrative institutions.

PPAD 723. Survey Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Overview of survey research methods with an emphasis on hands-on training in how to evaluate, conduct and analyze survey research.

PPAD 724. Seminar in Advanced Analytical Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PPAD 721 and PPAD 722, both with a minimum grade of B. Enrollment restricted to students in the Ph.D. in Public Policy and Administration program or with permission of instructor. This seminar is the final in a three-course sequence that introduces students to methods of research and its many different applications in public policy analysis and management. Building upon the knowledge and skills learned in the prerequisite courses, students will be trained to tackle some of the advanced statistical techniques in various applied public policy and management settings. The final sequence is especially intended for doctoral students who are serious about publishing in top peer-reviewed public policy and public management journals using quantitative techniques.

PPAD 726. Advanced Research Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers skills needed to develop independent research projects including all aspects of research design, measurement design, data analysis planning and interpretation, and report writing.

PPAD 730. Seminar in Health Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines key issues and alternative policy responses in health. Presents a framework for understanding health policy in terms of the regulatory environment, developing initiatives and emerging trends. Designed to assist students to build a program of research in health policy.

PPAD 740. Seminar in Public Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Doctoral students only. Examines key theoretical and empirical literature in public sector administration with an emphasis on state and local government. Covers the management of human resource, financial and information systems. Includes the impact of leadership, organizational design and policy on the conduct of public activities. Designed to assist students to build a program of research in public management.

PPAD 741. Advanced Theory in Public Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar aims to contribute to understanding public policy by examining the public administration context. It will assist participants, first, in gaining an overview of fundamental features of varieties of traditional public administration. The categories of public administration theory are described by Harmon and Mayer as classical, neoclassical, systems, human relations, market, interpretive and critical theories. Elsewhere, they are described in terms of science, technology, enterprise and hermeneutics. Second, this overview will also include exploring underlying and outlying perspectives that shape thinking and theorizing about public administration. Perspectives include traditional, business, economic, political, critical theory, post-structural, psychoanalytic, neuroscience, feminist, ethical and data. Third, this overview will provide post-traditional examples that can assist students in developing their own view of how public policy and administration theory and practice should be shaped.

PPAD 742. Institutions and Organizations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Organizational and institutional theories, in the broadest sense, look to the political, organizational and cultural contexts that shape social life. Some theories conceptualize environments in terms of networks and resources, within which social actors are “embedded.” Others stress historically built-up structures (e.g., laws and governmental agencies) that shape and channel subsequent dynamics. More radical theories argue that the core features of modern social actors, themselves, are largely products of social context, rather than existing a priori as many theories assume. This course explores theories of institutions and organizations to inform our thinking about the roles and responsibilities of the public, business and nonprofit organizations in shaping public life in a democratic society.

PPAD 750. Seminar in Urban Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Doctoral students only. Examines key issues in urban policy. Explores public policy as it relates to the natural, built, social, economic and political environments of urban life. Designed to assist students to build a program of research in urban policy.

PPAD 760. Criminal Justice Policy and Program Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The purpose of this course is to familiarize students with the main concepts of program evaluation, including but not limited to goals and objectives, needs assessment, process evaluation, and outcome evaluation in criminal justice settings.

PPAD 761. Risk Assessment in Criminal Justice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A large portion of criminal justice policy, research and practice has been devoted to risk assessment at the individual, group, and community or environmental levels. This course will assess what is known about applying existing risk, classification and prediction methods in the criminal justice system, and how data can be used to test the efficacy of these methods in different settings.

PPAD 780. Synthesizing Seminar in Public Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This is a required course for the Ph.D. in Public Policy and Administration. It is designed to expose students to various areas within public policy, particularly those of the concentration areas within the program: public policy (e.g. health and education), public administration, criminal justice policy and urban and regional policy. The course is designed to acquaint advanced doctoral students with the academic profession with primary focus on research, teaching and service.

PPAD 791. Topical Seminar. 1-3 Hours.
Semester course; 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisites: doctoral standing and permission of program director and instructor. An in-depth study of a selected topic in public affairs, policy or administration.

PPAD 792. Independent Study. 1-3 Hours.
Semester course; 1, 2 or 3 credits. May be repeated for a maximum of 6 credits. Prerequisites: doctoral standing and permission of program director and instructor. Independent study and research in selected areas of public affairs, policy and administration under the guidance of a graduate faculty member.

PPAD 898. Dissertation Research. 1-12 Hours.
Semester course; 1-12 hours. May be repeated for credit. Prerequisite: admittance to doctoral candidacy. Research on an approved dissertation subject.

Urban Studies (URSP)

URSP 502. Global Economic Change and Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. Explores the factors, both historical and contemporary, that have influenced the socioeconomic and environmental characteristics of national and subnational regions, mainly in the developing world. Analyzes development problems and strategies from various theoretical perspectives and examines the impacts of policy and planning interventions on regional conditions.

URSP 517. Historic Preservation in Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course surveys the process of historic preservation that includes the evaluation of sites, identification of architectural styles, the adaptive use of sites and structures, and the various sources available for implementing preservation proposals in government or the private sector. Preservation is considered as a tool in the planning process; and its application to neighborhoods, downtowns, and other city districts is considered.

URSP 520. Park Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Explores the general approaches and strategies for planning recreation areas and facilities. Topics include specific principles of design relating to outdoor recreation facilities; standards relative to space requirements, locations and programs; and trends in site design and planning.

URSP 521. Introduction to Geographic Information Systems. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. An introduction to creating and using geographically referenced databases for urban and environmental analysis and planning. Includes geographic and remote sensing data structures, global positioning systems, spatial analysis, geographic data standards, public domain software and data resources, and principles of cartography design. Lab exercises in the use of geographic information systems software tools. Crosslisted as: ENVS 521.

URSP 525. Site Planning and Graphics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Addresses the environmental impacts and capacity of environmental systems in relation to the site requirements of various urban and rural situations. Introduces the use of graphics as an aid in presenting and analyzing planning and design ideas, maps and plans.

URSP 541. Urban Public Policy-making Processes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discusses the politics of urban life. Examines the physical, demographic and economic environments in which conflict resolution occurs, as well as the actors on the local, state and federal levels that participate in the political process.

URSP 545. Sustainable Energy Policy and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discusses current energy production and consumption trends and related economic, environmental and social issues. Reviews energy planning and policy approaches from the international to local levels. Analyzes and evaluates different types of energy systems and existing and proposed energy policies.

URSP 567. The American Suburb. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides students with an understanding of the suburban movement in America, the elements of suburban growth and an awareness of current and emerging approaches to suburban planning and design. Includes neotraditional design, transit oriented development, new urbanism and master planned communities. A working knowledge of the U.S. Census is needed for some assignments.

URSP 591. Special Topics in Urban and Regional Studies and Planning. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Students will have an opportunity to examine in detail some questions of significance in the field of urban and regional studies and/or planning. See the Schedule of Classes for the prerequisites and specific topics to be offered each semester.

URSP 605. Urban Planning History. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discusses the historical context of planning solutions to contemporary urban problems by examining the rich planning tradition since the mid-nineteenth century in the U.S. Significant plans, people and movements in the history of planning are discussed in relation to the evolving traditions of the profession.

URSP 610. Introduction to Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces students to the planning profession. Provides an overview of the urban system and the history of planning, and covers the basics of comprehensive planning, including the context, process, agents, methods, components, and implementation. Prepares students for taking more specialized planning courses by introducing the sub-areas of planning, such as transportation planning, land use planning, environmental planning, housing, and urban design.

URSP 611. Principles of Urban Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Principles of urban design at the micro- and macro-scale. Expression of planning objectives in physical design, with emphasis on the relationship between urban design at various scales and the needs of individuals and groups.

URSP 621. Introduction to Geographic Information Systems. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours 3 credits. Introduces the components, capabilities, and functionalities of Geographic Information Systems. In addition to the concepts upon which GIS is based, how it works and what it does, this course introduces cartographic techniques necessary to design and construct effective maps with an emphasis on thematic mapping. It also examines the processing, compilation and symbolization of spatial data and the application of related analytical techniques. Laboratory work emphasizes practical applications and uses of ArcGIS and the spatial analyst extension.

URSP 622. Community Socioeconomic Analysis Using GIS. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Introduces students to data sources and database management for community analysis using geographic information systems. Includes an overview of database structures, public domain software and data resources, descriptive statistical analysis, population projection, graphic presentation of data, and principles of cartographic design. Laboratory exercises using GIS software and public domain data to describe communities and identify planning issues. Laboratory work emphasizes practical applications and uses of ArcGIS.

URSP 623. Research Methods for Government and Public Affairs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduction to the scope and methods of applied research for the public sector. Focuses on problem structuring through logical methods, exploring problems through observation and other methods of data collection, analyzing and summarizing findings using both qualitative and quantitative methods. Crosslisted as: GVPA 623/PADM 623/CRJS 623.

URSP 625. Spatial Database Management and GIS Modeling. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: URSP 621 or 622, or permission of the instructor. Introduces principles and applications of Geographic Information Science and GIS to transportation. Students discuss the fundamental scientific principles of capturing, representing, integrating, processing and analyzing digital geographic information about transportation infrastructure and systems. Concentrates on the applications of GIS-T software, tools and related technologies to transportation planning, intelligent transportation systems, environmental and hazards analysis and logistics.

URSP 626. Transportation Analytics and Modeling. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Introduces conventional travel demand forecasting techniques, i.e., the Urban Transportation Modeling System. UTMS typically consists of trip generation, trip distribution, mode choice and trip assignment. Land-use modeling and post-processing procedures will also be introduced. Additionally, other latest modeling developments, such as activity/tour-based modeling, 4D post-processing and land use/transportation integration models will also be explored. Case studies of the Virginia Transportation Modeling and its Cube Voyager applications are included.

URSP 627. GIS Applications in Urban Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: URSP 621 or 622, or permission of the instructor. Covers GIS tools and techniques in relation to 3D visualization, decision analysis, program evaluation and Internet-GIS. Emphasizes the integration of exploratory/predictive spatial analyses and 3D visualization into the decision-making process. GIS tools and techniques are used to automate decision analysis and facilitate future visioning in analyzing and visualizing decision actions. Laboratory work emphasizes practical applications and uses of ArcGIS, ArcIMS and the Scenario 360 software suite.

URSP 628. Land Use Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces students to the context, substance, practical skills, and implementation of land use planning. Covers such topics as land capacity, land use system and design, land use controls, state and regional growth management, resource land preservation, rural growth management, urban containment, and facility planning.

URSP 630. Strategic Planning and Management in the Public Sector. 3 Hours.
3 lecture hours. 3 credits. Explores the benefits and limitations of strategic planning and management in the public sector, examines approaches to strategic management, especially in terms of the role and behavior of top management, and provides an introduction to the analytic and process methods used in strategic planning and management. Crosslisted as: PADM 630.

URSP 632. Planning Theory and Processes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines major traditions in the theory of planning in the context of actual planning processes and outcomes. Explores in depth the political, economic, and institutional constraints to effective planning and plan implementation. Discusses the planners' ethical dilemmas. Crosslisted as: GVPA 632.

URSP 635. Legal and Legislative Foundations of Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Delineates the legal and legislative basis for planning at local, state, and federal levels. Judicial precedents in land use controls and environmental protection are investigated, including private controls, traditional zoning, administration of zoning ordinances, new flexible zoning concepts, development timing and growth controls, exclusionary land use practices, subdivision controls, and eminent domain regulations for environmentally sensitive areas, and environmental review.

URSP 637. Sustainable Community Development. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course includes both theoretical and practical aspects of sustainable development and its relationship to land-use planning. Through examination of the literature, class discussion, focused exercises and guest speakers, students will develop the skills needed to evaluate and propose activities to plan for sustainable development. The course begins with an overview of the origins and definitions of sustainability and developing operational principles of sustainable development. The three "Es" of sustainability (environment, equity and economics) are then explored and connected to the role of the planner in influencing the balance between these dimensions in practice. A variety of tools and initiatives for sustainable practices are introduced, followed by examination of standards for measuring progress toward sustainable goals. Finally, through the evaluation of case studies and construction of policy recommendations, students will propose guidance for adapting local government function and modifying regulations and policies for implementing and governing sustainable communities.

URSP 641. Citizen Participation and Negotiation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Studying the theory and practice of citizen participation and negotiation, planners learn to work with citizens in a democratic process while practicing respect for differing views.

URSP 643. Housing Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines federal, state, and local housing policy. Discusses the issues of affordable housing, homelessness, and the private sector's contribution to housing.

URSP 645. Sustainable Energy Planning and Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Discusses current energy production and consumption trends and related economic, environmental and social issues. Reviews energy planning and policy approaches from the international to local levels. Analyzes and evaluates different types of energy systems and existing and proposed energy policies.

URSP 647. Adaptive Reuse of Buildings. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Describes from a public sector perspective identification for new uses, evaluation of benefits and preparation of implementation proposals for recycling older buildings. Discusses methods used to develop the necessary design guidelines as well as analyze these opportunities that can be a catalyst for urban revitalization.

URSP 650. Natural Resources and Environmental Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines key problems and challenges linked to the use and abuse of natural resources, both nationally and globally, through urbanization, agriculture, coastal zone development, waste generation and other human activity. Students explore these problems in terms of the biophysical processes to which they relate, as well as their underlying political-economic and sociocultural causes. Also studied are policy and planning strategies aimed at more efficient and sustainable use of natural resources and the environment.

URSP 651. Transportation Policy and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an introduction to the urban transportation system. Sets the scene by exploring core concepts, providing an overview of passenger and freight movements in the urban context, describing the history of transportation and urban form and assessing the likely impact of information technology on travel patterns and urban form. Introduces the urban transportation planning process and contemporary trends in this process, places the planning process within the political context and provides an overview of the use of GIS in transportation planning. Course will also address pressing policy issues such as public transportation, land use/transportation integration, clean vehicles, clean fuels, land use, energy, finance, equity and environmental impacts.

URSP 652. Environmental Analysis. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisite: URSP 650. Familiarizes students with methods to carry out an environmental analysis. Provides a deeper understanding of environmental issues.

URSP 653. Transportation Projects. 3 Hours.
3 credits. Directed-research course in which students will complete a professional transportation project for a local or state government agency or nonprofit organization. For example, students might evaluate the effectiveness of a new high occupancy vehicle/toll lane in northern Virginia; develop an emergency evacuation plan for a small or midsized city; help a local government evaluate the likely transportation impacts of a new shopping mall; assist a local bus system in the development of more cost-effective transit routes; or finish a traffic-modeling and GIS application project.

URSP 654. Environmental Remote Sensing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ENVS 602, or permission of the instructor. This course provides a basic and applied understanding on the use of digital remote sensor data to detect, identify and characterize earth resources. Students are required to demonstrate an understanding of the spectral attributes of soils, vegetation and water resources through various labs involving both image- and non-image-based optical spectral data. Crosslisted as: ENVS 654/BIOL 654.

URSP 655. Environmental Policy and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Investigates the environmental protection role of urban and regional planning, including the ways in which local planning implements and enforces state- and federal-level environmental policies. Explores the role of planners in environmental assessment, i.e. evaluating the environmental impacts of public and private sector development.

URSP 658. Transportation Finance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces urban transportation financing principles, procedures and funding mechanisms. Explores existing governmental institutions, intergovernmental relations and laws/regulations pertaining to transportation financing. Also details urban transportation financing procedures, such as fund estimates, Call for Projects, fund programming and contract management, and the auditing process. In particular, the Local Assistance Program and Transportation Improvement Program in the Virginia Department of Transportation will be emphasized. Innovative financing mechanisms and procedures will also be incorporated. More recent state-of-the-practice funding mechanisms used by VDOT will be introduced through guest lectures by VDOT administrators and other practitioners.

URSP 659. Transportation Project Development and Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces urban transportation project development and evaluation concepts, principles, methodologies and procedures. Related transportation laws, regulations and guidelines will be covered. Some case studies in the greater Richmond area will also be included to help students understand real-world transportation development and implementation processes.

URSP 662. Foundations for Development Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces public planners to the nature and development of the urban economy. Uses case study analysis of an economy's industrial structure, labor market, and other features. Considers the roles of public planners in maintaining a healthy economy.

URSP 664. Urban Economic Development Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: URSP 662 or permission of the instructor. Examines the economic development planning and implementation processes through theory and case studies in urban settings. Special topics include economic development institutions and practices, small business development programs, labor force development, community-based development, and sustainable development strategies.

URSP 666. Urban Commercial Revitalization. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines renewal of declining commercial areas in cities and towns as tools in the planning process. Discusses and applies through fieldwork, market studies and other analysis methods, strategies for revitalization, public and private project financing and development.

URSP 672. Food Systems, Rural Development and Landscape Conservation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An interdisciplinary analysis of the socioeconomic and environmental issues facing rural regions, mainly of the United States, and their relationship to the modern food system and other factors. Also examines policy and planning strategies that can help improve rural economic conditions, conserve rural resources and landscapes and achieve food system sustainability.

URSP 681. International Urban Policy and Planning. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Offers a comparative analysis of planning practices and policies in both developing and developed countries. Covers such topics as local implications of globalization, regional development strategies, urban governance and management, urban economic policies, sustainable development and urban infrastructure and shelter delivery.

URSP 691. Topics in Urban and Regional Planning. 1-3 Hours.
Semester course; 1, 2 or 3 credits. Students will have an opportunity to examine in detail some questions of significance in the field of urban and/or regional planning. See the Schedule of Classes for the specific topics to be offered each semester.

URSP 761. Planning Studio. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisites: All core courses except URSP 762 and 764. Involves students as a group in a community-based planning project.

URSP 762. Professional Plan. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Prerequisites: URSP 761, URSP 797 and permission of instructor. Requires individual students to apply theory and methodology gained from the core courses to solve selected planning problems. Extended time may be granted with a grade of PR. Final grade of A, B, C, D or F will be awarded upon completion.

URSP 764. Thesis or Projects. 2-6 Hours.
2-6 credits. Prerequisites: Appropriate research methods course, a 3-credit URSP 797 and permission of instructor. Planning, preparation, completion, and presentation of a thesis or project. URSP 764 is an acceptable substitute for URSP 762 . Consent of instructor and chair required for this substitution.

URSP 794. Planning Practicum Seminar. 3 Hours.
Semester course; 3 credits. Provides an opportunity for a structured analysis of the student's internship experience. Professional skills are enhanced through lectures, assignments and discussions.

URSP 797. Directed Research. 1-3 Hours.
1-3 credits. May be repeated for a maximum of 6 credits. Prerequisites: Permission of instructor and graduate standing. Independent research into planning problems, issues, and theories.

School of Medicine

Anatomy and Neurobiology (ANAT)

ANAT 501. Dental Gross Anatomy. 6.5 Hours.
Semester course; 4 lecture and 3 laboratory hours. 6.5 credits. A systematic dissection and study of the human body with clinical correlation and emphasis on the head and neck.

ANAT 502. Microscopic Anatomy (Dentistry). 5 Hours.
Semester course; 44 lecture and 88 laboratory hours. 5 credits. A study of the normal tissues and organs of the human body at the microscopic level, with emphasis on the histological organization and development of the oral cavity.

ANAT 503. Dental Neuroanatomy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Through this course, students will develop broad-level knowledge of neuroanatomical structures and principles and the role of the nervous system. Dental clinical correlations will be used to illustrate the future clinical necessity for and application of this scientific background.

ANAT 505. Principles of Human Anatomy (Pharmacy). 3 Hours.
Semester course; 2.5 lecture and 1.5 laboratory hours. 3 credits. The structure of the human body is surveyed by studying micro-, neuro-, and gross anatomy. Emphasis is placed on basic concepts and their application to various body components.

ANAT 525. Advanced Functional Anatomy (Occupational Therapy). 5 Hours.
Semester course; 3 lecture and 4 laboratory hours. 5 credits. A study of the anatomy and kinesiology of the human body using prosected specimens and the dissected cadaver. Emphasis is placed on the study of the extremities, particularly the hand. Enrollment requires admission to the M.S.O.T. program.

ANAT 608. Functional and Clinical Neuroanatomy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Survey of the basic morphological and functional aspects of the mammalian nervous system, with emphasis on functionally and clinically relevant neuroanatomical concepts.

ANAT 609. Gross Anatomy. 5 Hours.
Semester course; 3 lecture and 4 laboratory hours. 5 credits. Macroscopic study of the human body, with clinical correlations, dissection and pro-section sessions.

ANAT 610. Systems Neuroscience. 4 Hours.
Semester course; 4 lecture hours. 4 credits. A study the neural circuits and function of systems in the central nervous system. Topics include sensory perception and integration, neural control of reflexes and voluntary movement, as well as a neural-systems approach to understanding certain diseases.

ANAT 611. Histology. 5 Hours.
Semester course; 4 lecture and 2 laboratory hours. 5 credits. A study of the basic light and electron microscopic structure of cells, tissues, and organs. Emphasis on correlating structure with function.

ANAT 612. Human Embryology. 2 Hours.
3-week course. 2 credits. Lectures present an overview of human embryology covering fertilization, implantation and the early stages of embryogenesis. Major organ systems including the gastrointestinal, cardiovascular and urogenital are covered, as well as the development of the limbs, pharynx, face and skull. In addition, students prepare a report on a selected topic in embryology affecting human health.

ANAT 613. Advanced Studies in Anatomy. 1-6 Hours.
1-6 credits. An in-depth study in specific areas of anatomy: histology, gross anatomy, and neuroanatomy.

ANAT 615. Techniques in Neuroscience and Cell Biology. 3 Hours.
Semester course; 4 lecture/lab hours. 3 credits. Recommended preparation: BIOC 503-504 or equivalent. Designed to provide in-depth coverage of techniques commonly used in neuroscience and cell biology. Topics include tissue processing for light and electron microscopy, immunocytochemistry, laser confocal microscopy, protein purification and analysis, molecular approaches to the study of the nervous system, genetic manipulation of protein expression, gene arrays, transgenic and knockout animal modes, and electrophysiological techniques including single and multi-unit extracellular recording, sharp intracellular recording and patch clamp recording. Consists of one two-hour meeting per week. Graded as Pass/Fail.

ANAT 617. Developmental Neurobiology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: permission of instructor. Designed to expose students to the fundamental mechanisms underlying the development of the central nervous system, including patterning, birth and death of neurons, axon guidance, formation, maintenance and plasticity of synaptic connections, and glial biology. Emphasis will be on the cellular and molecular aspects of these topics. The course consists of one meeting a week devoted to lectures (two one-hour lectures) and a second meeting devoted to a student-led discussion of scientific papers (two one-hour discussion meetings).

ANAT 620. Scientific Writing and Grantsmanship. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Lectures present an overview of preparation for writing scientific manuscripts and grant proposals. Emphasis is placed on putting methods of writing into practice. Students will submit written samples to be discussed and critiqued each week. Special sessions on manuscript and grant review processes are included, as well as instruction on how to best utilize electronic and library resources. Graded as Pass/Fail.

ANAT 630. Research Presentations. 1 Hour.
Semester course. 1 credit. Weekly research presentations by master's and doctoral students that focus on the students' ongoing research. Course provides a weekly forum for students to develop presentation skills and foster scientific discussion among students and faculty. Graded as Pass/Fail.

ANAT 690. Anatomy and Neurobiology Seminar. 1 Hour.
1 lecture hour. 1 credit. A course consisting of faculty and student-led seminars presenting current research in neurobiology, immunobiology, and reproductive biology. Graded as S/U/F.

ANAT 691. Special Topics in Anatomy. 1-4 Hours.
1-4 credits. Lectures, seminars, tutorial sessions, and/or library research assignments in selected areas of advanced study not available in other graduate level anatomy courses, or as concentrated emphasis on a particular area of research.

ANAT 697. Directed Research. 1-15 Hours.
1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.

Biochemistry (BIOC)

BIOC 502. Biochemistry (Medicine). 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students accepted in the School of Medicine. An introduction of structural biochemistry, intermediary metabolism, cell biology and methods of biochemical analysis as part of the fundamental background of modern medicine.

BIOC 503. Biochemistry, Cell and Molecular Biology. 1-5 Hours.
Continuous course; variable hours. 1-5 credits. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. A comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 504. Biochemistry, Cell and Molecular Biology. 1-5 Hours.
Continuous courses; variable hours. 1-5 credits. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. A comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 505. Experimental Biochemistry. 2 Hours.
Continuous courses; 4 laboratory hours. 2 credits. Prerequisite: BIOC 503 (or concurrent) or equivalent quantitative chemistry. Laboratory work, including theory and practice of advanced biochemical research methods.

BIOC 506. Experimental Biochemistry. 2 Hours.
Continuous courses; 4 laboratory hours. 2 credits. Prerequisite: BIOC 503 (or concurrent) or equivalent quantitative chemistry. Laboratory work, including theory and practice of advanced biochemical research methods.

BIOC 507. Bioorganic Chemistry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Permission of the instructor. Study of structure, chemistry, and mechanism of small, biologically important molecules.

BIOC 510. Radiation Safety. 1 Hour.
Semester course; 15 lecture hours. 1 credit. Provides basic principles for the safe use of radioactive materials in biological research and meets the minimum training requirements set forth for responsible investigators in the university's Nuclear Radiation License. Offered on a demand basis (2-4 times or approximately 20 students per year).

BIOC 524. Biochemistry (Pharmacy). 2 Hours.
Continuous courses; 2 lecture hours. 2 credits. Prerequisites: BIOC 501 or 523. Specialty topics in biochemistry are presented in the spring semester as part of the fundamental background of modern pharmacy.

BIOC 530. Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function. 2 Hours.
Modular course; 2 lecture hours. 2 credits. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. The first module of a group of four (BIOC 530-533), which taken together provide a comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 531. Biochemistry, Cell and Molecular Biology Module 2: Basic Metabolism. 1 Hour.
Modular course; 1 lecture hour. 1 credit. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. The second module of a group of four (BIOC 530-533), which taken together provide a comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 532. Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology. 1 Hour.
Modular course; 1 lecture hour. 1 credit. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. The third module of a group of four (BIOC 530-533), which taken together provide a comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 533. Biochemistry, Cell and Molecular Biology Module 4: Lipids/ Membranes and Bioenergetics. 1 Hour.
Modular course; 1 lecture hour. 1 credit. Prerequisites: undergraduate organic chemistry, physical chemistry recommended. Permission of instructor is required for any student not enrolled in a graduate (certificate, M.S. or Ph.D.) program. The fourth module of a group of four (BIOC 530-533), which taken together provide a comprehensive introductory course that describes basic biochemistry and reviews current concepts of modern cell and molecular biology.

BIOC 601. Membranes and Lipids. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOC 503. Comprehensive presentation of important areas in biological membrane research. Key topics include techniques in the study of membrane lipids and proteins, "order" and organization in membranes, transport, receptors and cell surface antigens, physical measurements in membranes, reconstituted systems, and signal transduction.

BIOC 602. Physical Properties of Macromolecules. 1-4 Hours.
Semester course; 4 lecture hours. 1-4 credits. Prerequisites: BIOC 503 and physical chemistry or permission of instructor. Structure of macromolecular components and macromolecules; biophysical approaches to the determination of structure.

BIOC 604. Enzymology. 1-3 Hours.
Semester course; 3 lecture hours. 1-3 credits. Students may register for module 1 only, modules 1 and 2, or modules 1, 2 and 3. Prerequisite: BIOC 503. Physical and chemical properties and mechanisms of action of enzymes. Treatment of chemical catalysis, enzyme kinetics and correlation of enzyme structure to mechanisms.

BIOC 605. Molecular Biology. 2 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: undergraduate chemistry or biochemistry. An advanced course on molecular biology. Eukaryotic replication, transcription, RNA processing, control of gene expression, translation, cell cycle, oncogenes and tumor suppressors, viral vectors, and gene therapy.

BIOC 610. Current Trends in Biochemistry. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: BIOC 503-504. A study and literature review of common and complex biochemical substances using recent research methodology.

BIOC 651. Biochemistry Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Talks given by students describing and critiquing recent published research or review articles.

BIOC 652. Cancer Biology Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Permission of instructor is required for any student not enrolled in a graduate program. Oral presentations/discussions on the advances in cancer biology research in order to further the field in cancer research and critically evaluate and understand scientific research articles. Graded S/U/F.

BIOC 661. Critical Thinking. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Paper presentations and discussions of important topics in biomedical science.

BIOC 662. Signal Metabolism Lipids. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Talks given by faculty members, students describing research progresses or discussion of recent published research or review articles.

BIOC 690. Biochemistry Seminar. 1 Hour.
Semester course. 1 credit. Reports on recent biochemical literature and research by students and staff. Graded as S/U/F.

BIOC 691. Special Topics in Biochemistry. 1-4 Hours.
Semester course; 1-4 credits. Lectures, tutorial studies and/or special assignments in selected areas of advanced study not available in other courses or as part of research training.

BIOC 692. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

BIOC 695. Biochemistry Student Seminar. 1 Hour.
Semester course; 1 seminar hour. 1 credit. Reports by students on their thesis research projects. Graded as Satisfactory/Unsatisfactory/Fail.

BIOC 697. Directed Research in Biochemistry. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.

Biostatistics (BIOS)

BIOS 512. Basic Mathematical Statistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course builds the basics of probability theory and applications of probability theory toward statistical inference. Students will learn about the mathematical paradigm behind most statistical inference used in basic data analysis, estimation and hypothesis testing.

BIOS 513. Mathematical Statistics I. 3 Hours.
Continuous course; 3 lecture hours. 3 credits. Prerequisite: MATH 307. Probability, random variables and their properties, distributions, moment generating functions, limit theorems, estimators and their properties; Neyman-Pearson and likelihood ratio criteria for testing hypotheses. Crosslisted as: STAT 513.

BIOS 514. Mathematical Statistics II. 3 Hours.
Continuous course; 3 lecture hours. 3 credits. Prerequisite: STAT 513/ BIOS 513. Probability, random variables and their properties, distributions, moment generating functions, limit theorems, estimators and their properties; Neyman-Pearson and likelihood ratio criteria for testing hypotheses. Crosslisted as: STAT 514.

BIOS 516. Biostatistical Consulting. 1 Hour.
Semester course; 1 lecture hour. 1 credit. The principles dealing with the basic art and concepts of consulting in biostatistics. The nonstatistical course discusses role, responsibilities of biostatisticians, relationship between clients and consultants, method of writing reports, etc.

BIOS 524. Biostatistical Computing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Techniques for biostatistical computing are presented by way of contemporary statistical packages. Students learn how to create and manage computer data files. Methods for data entry, preparation of data for analysis and summaritive procedures are covered. Students learn the basics of random number generation and its applications, numerical methods for statistical algorithms, and concepts of numerical accuracy and stability. Advanced topics include interactive matrix and macro languages. Emphasis is placed on computational methods and data management rather than on statistical methods and procedures.

BIOS 531. Clinical Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is intended primarily for clinicians. Permission of the course coordinator is required for others interested in registering. Epidemiological concepts necessary for evidence based studies of medicine. Specific topics will include: cause and effect criteria, demographic rates, measures of association or effect, study designs, decision trees, meta-analysis, evaluation of the literature, sources of data, reliability and validity, bias, confounding and effect modification, screening and diagnostic tests, sensitivity, specificity, false positives, false negatives, applications of the above to diagnosis and treatment, treatment efficacy and improved patient care.

BIOS 543. Graduate Research Methods I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with graduate standing, or one course in statistics and permission of instructor. This course is intended for graduate students and researchers without formal training in the statistical and biostatistical sciences. Students enrolled in this course will study various aspects of the research process, from creating the research question to publication. Particularly, students will learn sampling theory, the roles of probability, chance and variability in measurement and decision-making, study design characteristics and validity, basic data management, visualization and summarization, simple techniques for analyzing categorical data (e.g., chi-square test, exact tests), common techniques for analyzing continuous data (t-tests, analysis of variance, correlation and simple linear regression), and statistical decision-making. These topics will be covered through a variety of approaches, including traditional lecture, group discussion and in-class activities, and students will be assessed on their ability to understand statistical considerations in the study design process, appropriately perform simple statistical procedures and report statistical findings using the IMRaD format. The appropriate use of data management and statistical procedures will be modeled using several commonly used software packages. Students may receive degree credit for only one of BIOS 543, STAT 441, STAT 541, STAT 543 or STAT 641. BIOS 543 is not applicable toward the M.S. degree in mathematical sciences or the M.S. degree in computer science.

BIOS 544. Graduate Research Methods II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 543 or STAT 543 or permission of instructor. This course is intended for graduate students and researchers without formal training in the statistical and biostatistical sciences. Students enrolled in this course will study various aspects of statistical model-building, including adjusting estimates for other measurements, creating multivariate models, analyzing noncontinuous outcomes and summarizing results. Particularly, students will learn multiple linear regression, multifactor analysis of variance, analysis of covariance, random and mixed effects models, repeated measure and longitudinal data analysis, logistic and Poisson regressions, and time-to-event analysis. These topics will be covered through a variety of approaches, including traditional lecture, group discussion and in-class activities, and students will be assessed on their ability to understand statistical considerations in the model-building process, appropriately perform intermediate statistical procedures and report statistical findings using the IMRaD format. The appropriate use of data management and statistical procedures will be modeled using several commonly used software packages. Students may receive degree credit for only one of BIOS 544 or STAT 544.

BIOS 546. Theory of Linear Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 513 and BIOS 553. Review of linear algebraic concepts and matrix operations. Topics include generalized inverses and systems of equations; distribution of quadratic forms under normal theory; general linear model of full rank and less-than-full rank; least squares and maximum likelihood estimation; hypothesis testing; multiple linear regression; analysis of variance; balanced and unbalanced design.

BIOS 547. Applied Data Analysis in Public Health I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: EPID 547. This course is the first in a two-semester sequence in biostatistical methods for students in the Master of Public Health program. Basic probabilistic and statistical concepts will be introduced, such as probability theory and distributions, hypothesis testing, and sampling methodology. The course will also focus in detail on commonly used statistical methods for categorical and continuous measurements, including chi-square tests, t-tests, ANOVA and regression. The material will be motivated by data sets from public health studies.

BIOS 548. Applied Data Analysis in Public Health II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: EPID 548. This course is the second in a two-semester sequence in biostatistical methods for students in the Master of Public Health program. Advanced statistical methods commonly used in public health research will be covered, including ANOVA, multiple linear regression, ANCOVA, mixed effects models, repeated measure designs, logistic regression and survival analysis. The material will be motivated by data sets from public health studies.

BIOS 549. Spatial Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 543 and BIOS 544 or permission of instructor. Introduces students to spatial data and the statistical methods to appropriately analyze them. Covers spatial data visualization and manipulation, spatial point pattern analysis, interpolation and geostatistics for point-referenced data, and spatial regression modeling of areal data. Includes the use of a statistical software package for data analysis.

BIOS 553. Biostatistical Methods I. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisites: one course in statistics and permission of instructor. Introduces applied biostatistical concepts intended primarily for graduate students in the Department of Biostatistics. Topics include linear algebra for statistical algorithms, distributions of quadratic forms, simple and multiple linear regression, model selection and regression diagnostics, analysis of variance and covariance, and linear mixed effects models.

BIOS 554. Biostatistical Methods II. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: BIOS 553. Continued study of applied biostatistical concepts intended primarily for graduate students in the Department of Biostatistics. Topics include categorical data analysis, generalized linear models, generalized linear mixed models, generalized additive models, non-linear regression and survival analysis.

BIOS 567. Statistical Methods for High-throughput Genomics Data I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 524 and 546; and BIOS 544 or 554; or permission of instructor. Provides a detailed overview of all aspects pertaining to the preprocessing and analysis of data from high-throughput genomic experiments, such as normalization techniques, expression summaries, quality control assessments and data reduction methods. Presents strategies for class and identification of important molecular features. Includes hands-on experience using statistical software for processing and analyzing genomic data.

BIOS 571. Clinical Trials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Concepts of data management and statistical design and analysis in single-center and multicenter clinical trials. Data management topics include the collection, edition, and validation of data. Statistical design topics include randomization, stratification, blinding, placebo- and active-control groups, parallel and crossover designs, and power and sample size calculations. Statistical analysis topics include sequential and group sequential methods.

BIOS 572. Analysis of Biomedical Data I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: one course in statistics and permission of instructor. This course provides an overview of the analysis of continuous response data. The material begins with a brief review of theoretical tools used in inference and segues into common univariate and bivariate statistical methodologies for the analysis of continuous response data. Model-based statistical methodologies including linear regression, ANOVA, ANCOVA and mixed-effect models will also be covered. Practical consideration and usage of statistical methods, utilizing commonly used statistical software packages, will be emphasized over theoretical underpinnings of the methods.

BIOS 573. Analysis of Biomedical Data II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 572. This course provides an overview of the analysis of categorical data. The course begins with a brief review of commonly used probability distributions for binary, ordinal, count and time-to-event measurements, then segues into chi-square and tabular testing. Model-based statistical methods including logistic regression, Poisson regression, log-linear modeling and survival analysis will be covered. Practical consideration and usage of statistical methods, utilizing commonly used software packages, will be emphasized over the theoretical underpinnings of the methods.

BIOS 610. Research Processes and Methods for the Health Professions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 531 or permission of instructor. Focus on research processes, methods and research proposal (RO1) writing for the health professions. Course will emphasize conceptual underpinnings of research; the continuum of methodologies, including qualitative date collection; and development of a relevant research question -- all toward writing a fundable proposal. Topics include framing a relevant research question, writing a problem statements and aims, synthesizing and critiquing relevant literature, project management, developing project budget and justification, as well as critically reviewing grants and serving on a mock study section.

BIOS 615. Advanced Inference. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: BIOS/STAT 513, BIOS/STAT 514 or permission of instructor. Mathematical preliminaries: probability and expectation, modes of convergence, delta method, statistical limit theorems; ARE; asymptotic likelihood-based procedures. Decision theoretical approach to statistical inference; decision rules; admissibility. Bayes procedures. Point estimation; unbiasedness; efficiency. Hypothesis testing: the Neyman-Pearson theory; unbiasedness and invariant tests; conditional tests; likelihood-based tests. Nonparametric statistics: U statistics, rank-based tests, permutation test. Interval estimation; confidence sets; relationship between confidence sets and families of tests. Algorithms in statistical computation: EM algorithm, Newton Raphson method. Modern methods for controlling false discovery rate.

BIOS 616. Advanced Inference. 4 Hours.
Continuous courses; 4 lecture hours. 4 credits. Prerequisite: BIOS 514 or permission of instructor. Mathematical preliminaries: probability and measure; integration; modes of convergence. Decision theoretical approach to statistical inference; decision rules; admissibility. Bayes and minimax procedures, invariance; complete classes. Point estimation; unbiasedness; efficiency; M, L, and R estimators; U statistics. Hypothesis testing: the Neyman-Pearson theory; unbiasedness and invariant tests; conditional tests; permutation tests; rank tests; likelihood based tests. Interval estimation; confidence sets; relationship between confidence sets and families of tests; unbiased and invariant confidence sets. Asymoptotics; stochastic convergence; statistical limit theorems; ARE; asymptotic likelihood based procedures. Overview of robust statistical procedures.

BIOS 621. Nonparametric Statistical Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: any two courses of statistics or permission of instructor. Estimation and hypothesis testing when the form of the underlying distribution is unknown. One-, two- and k-sample problems. Tests of randomness, Kolmogorov-Smirnov tests, analysis of contingency tables and coefficients of association. Crosslisted as: STAT 621.

BIOS 625. Categorical Data Analysis and Generalized Linear Models. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisites: BIOS 514, 554 and 572. Introduction to the theory and methods of analysis of categorical data. Topics include exact and asymptotic analysis of contingency tables; measures of association and agreement; theory and applications of generalized linear models, maximum likelihood estimation and related numerical methods; linear models with different link functions and distributions; model fitting; and diagnostics.

BIOS 631. Mixed Models and Longitudinal Data Analysis. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisites: BIOS/STAT 514, 546 and 554. Introduction to longitudinal data structures and statistical inference. Multivariate theory and applications of normal mixed models, generalized linear mixed models, mixed models for categorical data, nonlinear mixed models and multiple imputation methods for missing data.

BIOS 632. Multivariate Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS/STAT 514 and 554. One-and two-sample multivariate tests; invariance: MANOVA, MANCOVA and multiple design models; nonparametric methods; inference with covariance matrices; principal components; factor analysis; discriminate analysis; clustering.

BIOS 635. Structural Equation Modeling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: two graduate-level statistics courses or permission of instructor. This course provides an overview of the principals and applications of the general statistical framework structural equation modeling. The course provides an introduction to the concepts, methods, problems and applications of SEM. Topics covered include the modeling of observed variables, consequences of measurement error, modeling of latent variables and longitudinal structural equation models.

BIOS 638. Statistical Design and Analysis in Toxicology. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisites for BIOS students: BIOS 514 and 554. Prerequisite for non-biostatistics students (who can enroll on a Pass/Fail basis): BIOS 554. Classical bioassay, dose-response relationships, continuous and quantal data; probit and logit analysis; estimation of the ED50; combination experiments; low dose extrapolation and risk assessment; carcinogenicity, mutagenicity, and teratogenicity screening; overview of laboratory and experimental problems for the toxicologist. Non-biostatistics students may enroll on a pass/fail basis.

BIOS 639. Statistical Design and Analysis in Toxicology. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisites for BIOS students: BIOS 514 and 554. Prerequisite for non-biostatistics students (who can enroll on a Pass/Fail basis): BIOS 554. Classical bioassay, dose-response relationships, continuous and quantal data; probit and logit analysis; estimation of the ED50; combination experiments; low dose extrapolation and risk assessment; carcinogenicity, mutagenicity, and teratogenicity screening; overview of laboratory and experimental problems for the toxicologist. Non-biostatistics students may enroll on a pass/fail basis.

BIOS 647. Survival Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 514 and 554 or permission of instructor. The analysis of survival (or failure time) data, with/without censoring. Actuarial and life-table methods, nonparametric and parametric estimation of survival functions, and comparison of survival curves; regression methods, such as the Cox proportional hazards model; competing risks; sequential models; applications to clinical trails.

BIOS 649. Advanced Spatial Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 543, BIOS 544, BIOS 549 or permission of instructor. This course focuses on the development and application of advanced statistical models for spatial and spatial-temporal data in a Bayesian hierarchical modeling framework. The data considered in this course include spatially referenced normal, binary, count and time-to-event health outcomes. Statistical methods covered include linear and Poisson regression, spatial survival analysis, spatial longitudinal analysis, multivariate disease modeling and spatio-temporal disease mapping. Students will gain practical experience in the application of the methods in commonly used software packages.

BIOS 650. Design and Analysis of Response Surface Experiments. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate status in mathematical sciences or systems modeling and analysis, or permission of the instructor. Philosophy, terminology and nomenclature for response surface methodology, analysis in the vicinity of the stationary point, canonical analysis, description of the response surface, rotatability, uniform information designs, central composite designs and design optimality. Crosslisted as: STAT 650.

BIOS 660. Sequential Analysis and Advanced Design and Analysis of Clinical Trials. 3 Hours.
3 lecture hours. 3 credits. Prerequisites: BIOS 514 and 554. Sequential methods versus fixed sample methods; the sequential probability ratio test with extensions and modifications; some applications of Cox's theorem; overview of analysis of clinical trials; closed and truncated tests; group sequential tests in clinical trials; sequential monitoring; sequential estimation; other topics with emphasis in clinical trials.

BIOS 667. Statistical Learning and Data Mining. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 514, 524 and 554. Provides a detailed overview of statistical methods used to discover the underlying structure of large complex datasets. Specific topics will include discrimination analysis, k-nearest neighbors, naive Bayes classifiers, classification and regression trees, ensemble methods, random forests, L1 penalized models, bootstrap and cross-validation methods. The course includes hands-on experience using statistical software for each method.

BIOS 668. Statistical Methods for High-throughput Genomic Data II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 567. A continuation of BIOS 567 that will introduce methods of additional high-throughput genomic assays, including comparative genomic hybridization for copy number change analysis and next generation sequencing methods. Methods that will be addressed include issues in mapping reads, variability in representation of sequences, normalization of raw count data, ChIP-Seq analysis, and RNA-Seq analysis.

BIOS 671. Nonlinear Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOS 554. Nonlinear modeling is an important tool for biostatisticians working with clinical and pre-clinical applications of dose responsiveness. Addresses issues regarding estimation, inference and experimental designs associated with nonlinear models. Special attention is paid to sigmoid-shaped models and threshold or piecewise models. Both the generalized nonlinear least-squares and quasi-likelihood estimation criteria are developed for these models. In addition to the usual univariate data structure, nonlinear mixed models are described and illustrated with examples. Includes hands-on experience with available SAS software for data analyses.

BIOS 688. Applied Bayesian Biostatistics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces the basic paradigm of Bayesian statistics along with the tools toward application of the methods in various data analysis situations. Covers Bayesian point estimation, interval estimation and model selection in univariate and multiparameter cases. Both conjugate and nonconjugate problems will be discussed. Modern Bayesian computation tools, such as rejection sampling, importance sampling, Gibbs sampling and Metropolis-Hastings algorithm, will be introduced with details of applied examples. A first introduction to Bayesian nonparametrics will also be done.

BIOS 690. Biostatistical Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Talks by the students, faculty, and visitors describing recent research or reviewing topics of mutual interest.

BIOS 691. Special Topics in Biostatistics. 1-4 Hours.
Semester course; lecture and laboratory hours by arrangement. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized biostatistical procedures not available in other courses or as part of the research training.

BIOS 692. Special Topics. 1-3 Hours.
Semester course; 1-3 variable hours. 1-3 credits. Lectures, tutorials, library assignments in selected areas not available in other courses or as part of the research training. Graded as S/U/F.

BIOS 697. Directed Research in Biostatistics. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.

Drug and Alcohol Studies (IDAS)

IDAS 689. Independent Study in Addiction. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Prerequisite: permission of program director. Independent study to be done with a faculty adviser.

Family Medicine and Population Health (EPID)

EPID 547. Applied Data Analysis Lab I. 1.5 Hour.
Semester course; 1.5 laboratory hours. 1.5 credits. Corequisite: BIOS 543. Lab sessions will focus on hands-on data analysis and presentation techniques using SAS statistical software. The labs will also provide exercises to help students more fully understand the statistical principles presented in the corequisite lecture course (BIOS 543).

EPID 548. Applied Data Analysis Lab II. 1.5 Hour.
Semester course; 1.5 laboratory hours. 1.5 credits. Prerequisite: BIOS 543, EPID 547 with minimum grade of B. Corequisite: BIOS 544. Lab sessions will focus on hands-on data analysis and presentation techniques using SAS statistical software. The labs will also provide exercises to help students more fully understand the statistical principles presented in the corequisite lecture course (BIOS 544).

EPID 571. Principles of Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Offers the theoretical foundations, concepts and principles of epidemiological research methods utilized to examine the distribution and determinants of diseases or other health problems. Entails understanding of measures of disease frequency and association, descriptive and analytic studies, community surveys, sampling, bias, confounding surveillance, outbreak investigation, screening and research proposal writing. Also provides basic foundations for data analysis and its translation into health care planning, management and policy formulation.

EPID 580. Public Health Ethics. 1 Hour.
Semester course; 1 lecture hour (hybrid online/face-to-face). 1 credit. The class examines, from an ethical perspective, federal and state public health practices, privacy and confidentiality issues; the Public Health Code of Ethics; legal power given to public health, ethics in responding to typical public health scenarios, the impact of public health ethics on public health decision-making; barriers to the ethical practice of public health; and responding to unethical events. Through exploration of principles of public health ethics, students in the course will examine current and past ethical issues in public health, drawing from case studies and current events. Included are issues such as immunization, social justice, distribution of limited resources and the evolution of the discipline of public health ethics.

EPID 593. Foundations of the Public Health Profession. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Enrollment restricted to M.P.H. program students. This is a two-semester course series of practical knowledge and experience for first-year Master of Public Health students. The course offers didactic training in basic public health operations, work of local public health organizations and research teams, human research subjects protection, selected cross-cutting and career skills and leadership principles in preparation for a future assignment in a professional public health setting. By the end of the semester, students will have selected a professional public health organization or research team with which they will complete practical experience hours the following semester. Graded as S/U.

EPID 594. MPH Practicum. 2 Hours.
Semester course; 8 practicum hours. 2 credits. Prerequisite: EPID 593. Enrollment restricted to M.P.H. students. Students work 120 practical hours over the course of one semester (8 hours per week average) in a professional public health setting and engage in selected training to develop a foundation of basic skills in areas such as communication, leadership and professionalism. The practicum placement will be made according to student area of interest. Students will work as members of collaborative public health teams fulfilling varied missions. Each student will have a personalized experience, which could include team tasks, shadowing public health professionals, attending meetings, data entry, descriptive data analysis, transcription of focus group discussions, creation of health promotional materials and participating in other organizational activities that will provide a basic foundation of knowledge and experience in public health research and/or practice. Graded as S/U.

EPID 600. Introduction to Public Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Describes the public health system in the United States. Explores the disease prevention and philosophy and foundations of public health management, economics, law, ethics and education. Examines the use of epidemiology and statistics to determine personal, environmental, and occupational health problems.

EPID 601. Contemporary Issues and Controversies in Public Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course introduces students to current issues and controversies in public health such as HIV transmission risk behavior, poverty, globalization, gun control, health care access and obesity. Students will be able to describe these controversies and argue differing perspectives on the major issues.

EPID 603. Public Health Policy and Politics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides an understanding of the public health policy development process, the influence of politics and special interest groups on this process, and current governmental policies for the provision of major public health services. The legislative process is a major focus of the course.

EPID 604. Principles of Environmental Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course is designed to provide an overview of environmental health. It provides an introduction to the methods used to understand the impact of environmental hazards on human health, such as toxicology, exposure assessment and environmental epidemiology; surveys the nature and control of environmental hazards that may cause or exacerbate health issues; and touches on some hot topics and current controversies in the field. In addition to providing a broad introduction to environmental health, this course aims to teach students how to research environmental health topics and critically assess environmental health literature.

EPID 606. Epidemiologic Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571, minimum grade of B. Focuses on examining the design, conduct and analysis of major epidemiologic studies and the methods to deal with the problems of bias, confounding and effect modification; using multivariate modeling techniques focusing on applications of logistic regression and Cox proportional hazards models to answer relevant research questions; solving meta-analytic problems using fixed and random effects models; understanding specific research areas of disease screening and exposure assessment; writing a research paper based on literature review and data analyses of a large dataset demonstrating application of essential epidemiologic abd biostatistical principles.

EPID 607. Nutritional Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571. This course focuses on methods of measuring exposures to dietary factors for epidemiological investigations of diet-disease relationships and risk assessment. An introductory course in basic epidemiology is a prerequisite. Students learn to select the most appropriate method(s) of collecting and analyzing food intake and to evaluate the adequacy of dietary assessment methods used in published epidemiological studies.

EPID 620. Cancer Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; and BIOS 544 and EPID 548, both with a minimum grade of B. Covers general principles of carcinogenesis and the genetics of cancer; domestic and international patterns in cancer incidence and mortality; cancer surveillance and screening, and their relation to cancer prevention; epidemiologic characteristics and risk factors for cancers to the lung, breast, prostate, gastrointestinal tract, pancreas, bladder, endometrium, ovary, cervix and skin, as well as cancer in children and young adults; and the public health implications of cancer. Additional focus on critical evaluation of different methodological approaches used in cancer research and potential biases inherent given study designs.

EPID 622. Maternal and Child Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; BIOS 543 and BIOS 544, with minimum grades of B; and EPID 547 and EPID 548, with minimum grades of B; or permission of instructor. Exposes students to current issues in maternal and child health in the U.S., taking an applied approach that balances discussion of literature, applications to public health practice and practical data experience. The course will explore how policies and social determinants of health influence MCH outcomes. Students will learn about key MCH topics including intergenerational risk factors, low birth weight, infant mortality, developmental disabilities and injury and violence prevention. Students will use epidemiological methods to evaluate MCH data to determine risk and protective factors for women and children and describe how these data guide public health policy and program-planning efforts.

EPID 624. Chronic Disease Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571 with a minimum grade of B or permission of the instructor. Course will cover the contribution of chronic diseases to population disease and disability as well as identify the incidence, prevalence and financial impact of each of the model diseases addressed. At the conclusion of the course, the student should be able to apply the concepts to all chronic diseases. The student will analyze selected current research in the area and determine points at which translational research is likely to improve the ability of the health care system to manage these problems.

EPID 642. Advanced Epidemiological Protocol Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; EPID 606 or equivalent; and BIOS 554 Develops skills needed to design and describe in written format a valid and appropriate epidemiology study to address specific hypotheses. Hypotheses and possible design methods will be discussed in class and subsequently students will present (both orally and in written form) a research design to include a critical review of the literature and hypotheses to be tested. The proposal must address sample size and power, exposure definition, methods for accurate exposure assessment, prevention of measurement errors, and statistical methods proposed for analysis.

EPID 646. Epidemiology of Psychiatric and Substance Use Disorders. 3 Hours.
Semester course; 2 lecture and 1 laboratory hours. 3 credits. This course is intended to introduce the descriptive and analytic epidemiology for major mental disorders of childhood, adulthood and late adult life. The course will address three main topics: (1) conceptual and methodological considerations in psychiatric epidemiologic research, (2) the descriptive epidemiology of major psychiatric and substance use disorders and (3) the analytic epidemiology of major psychiatric and substance use disorders. The course will also examine issues of classification and the nosology of psychiatric disorders as well as operational case definitions and the measurement techniques for field surveys and risk-factor research. Students will become familiar with epidemiologic surveys appropriate for risk factor research for psychiatric and substance use disorders. Prerequisitefor master's students: EPID 571 with a minimum grade of B; prerequisite for doctoral students: EPID 650 with a minimum grade of B; or permission of instructor.

EPID 648. Behavioral Epidemiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571; SBHD 605 with a minimum grade of B; and BIOS 543 or BIOS 547 and EPID 547 with minimum grades of B; or permission of instructor. Covers behavioral epidemiology and its role in public health. Students will be able to identify and explain the appropriate methods for measuring health-related behaviors and related psychosocial constructs; critically analyze the appropriateness of methods used within published studies on behavior as well as determine appropriate methods for behavior-related research questions; and apply behavioral theory/models to current public health problems including, but not limited to, intervention development and evaluation.

EPID 649. Analysis of Health Datasets. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisites: EPID 650 and STAT 643, or permission of instructor. Epidemiologic research, health services research and social/behavioral science research very often conduct "secondary analysis" of existing population-level datasets, as well as different forms of health care data (claims data, electronic prescribing data, electronic medical records). At the end of the course, students will be familiar with the scope of available large, population-based public datasets for health care and public health research. They will understand the strengths and limitations of using these datasets for secondary research and be able to apply this understanding to decisions regarding research questions, dataset use and analysis plans. In the process, they will also develop skills in manipulating complex administrative data sources (including claims data, electronic prescribing data and electronic medical records). Students will acquire knowledge to deal with potential challenges in implementing case-control or cohort studies based on data collected for reasons other than for research. Competencies in sampling methods, weighting, small area estimation techniques, probabilistic matching, multiple imputation methods, geocoding and other issues will be emphasized. Students will download, link and analyze several data sets to understand the advantages of these data. Familiarity with statistical analysis software is required.

EPID 650. Epidemiologic Methods for Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Intermediate level epidemiology course (such as VCU's EPID 606) at the master's level, with minimum grade of B; or permission of the instructor. Students will learn principles of epidemiologic methods and their application for analysis and interpretation of public health data. This course provides advanced introductory training for conducting epidemiologic investigations of disease etiology, surveillance and health care services, as well as for interpretation of published epidemiologic studies. Upon completion, students should be sufficiently familiar with epidemiologic research methods to begin applying these methods in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

EPID 651. Intermediate Epidemiologic Methods for Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 650, minimum grade of B. Course will provide in-depth understanding of epidemiologic methods and their application for analysis and interpretation of public health data. This course emphasizes decision-making in research methods to increase the efficiency of study design by reducing bias. Students will gain expertise in methodologic thinking as applied to their own work. Nonexperimental study designs are the focus of the class. Course provides opportunities for students to develop expertise in reading epidemiologic methods research. Upon completion, students should have attained expertise in epidemiologic research methods to apply in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

EPID 652. Advanced Epidemiologic Methods and Data Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 651 and STAT 744, both with minimum grade of B. Focuses on development of analytical strategies for data analysis guided by epidemiologic principles. Specific statistical modeling will be tailored for analysis of data from cross-sectional, case-control and cohort studies with emphasis on causal inference, prediction, controlling for confounding and assessment of interaction and intermediate effects. Course topics include logistic regression, Poisson regression, Cox proportional hazards model, propensity score method, generalized estimating equations and path analysis technique.

EPID 690. Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Talks given by students and faculty describing and critiquing recent published research or review articles. Graded as S/U/F.

EPID 691. Special Topics. 1-6 Hours.
Semester course; variable hours. 1-6 credits. This course provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member.

EPID 692. Independent Study. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Provides the opportunity for students to explore a topic of interest under the direction of a faculty member. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member and graduate program director.

EPID 693. Public Health Internship. 1-3 Hours.
Semester course; 1-3 field experience hours. 1-3 credits (60 hours per credit). Prerequisites: 18 credits in the M.P.H. program; EPID 548, EPID 571 and BIOS 544, all with minimum grades of B. Students will spend 180 hours in a planned, supervised experience with a community agency. Such agencies might include a local free clinic or other nonprofit organization, such as the American Cancer Society, or a local, state or federal public health agency. Graded as S/U/F.

EPID 694. MPH Capstone Project. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Each student will complete a research project that demonstrates the application of the knowledge acquired in the MPH program. The student will answer one or more relevant research or applied practice questions; the final product is a scholarly written report of publishable quality. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with a faculty member and approved by the graduate program director. Graded as S, U or F.

EPID 696. Special Topics. 1-3 Hours.
Semester course; 1-3 variable hours. 1-3 credits. Provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member. Graded as S/U/F.

EPID 697. Directed Research in Epidemiology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the Ph.D. degree. Graded as "S," "U" or "F.

Healthcare Policy and Research (HCPR)

HCPR 601. Introduction to Health Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course will familiarize students with the major players and issues in health care policy, using health reform in the U.S. as a framework through which to analyze the issues of cost, quality and access, and will focus on the roles of payers, providers and patients in the health care system. This course is interactive and uses studies from the scientific literature, class discussion and lectures from experts in the field. Students are required to write a paper evaluating the challenges regarding a public health policy topic in the U.S. and prepare a group presentation addressing questions related to key issues of the U.S. health care system.

HCPR 610. Foundations in Health Services Research Methods. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Will provide students with the opportunity to learn and apply basic data analysis skills and statistical methods common in health services research including programming, data cleaning and fundamental approaches in univariate, bivariate and multivariate analyses.

HCPR 691. Special Topics in Healthcare Policy and Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisite: permission of instructor. The course may include discussion of research topics of emerging interest/importance and published papers of current interest; new findings in health services research, health economics and health policy; and the application of research methods and study design to current topics within the broad field of healthcare policy and health services research, focusing on interdisciplinary research and applied methods. Graded S/U/F.

HCPR 692. Special Topics in Healthcare Policy and Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisite: permission of instructor. The course may include discussion of research topics of emerging interest/importance and published papers of current interest; new findings in health services research, health economics and health policy; and the application of research methods and study design to current topics within the broad field of healthcare policy and health services research, focusing on interdisciplinary research and applied methods.

HCPR 697. Independent Study in Healthcare Policy and Research. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for a maximum of 6 credits. Provides the opportunity for students to conduct research under the direction of a faculty member. A proposal for a course of study must be submitted to and approved by the program director of the Ph.D. in Healthcare Policy and Research. Credits will be assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member and department chair. Graded as S/U/F.

HCPR 699. Departmental Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Students will attend seminars presented by faculty and invited guests on topics and trends within health policy and health services research. Students and faculty will meet weekly to discuss the theoretical concepts and papers presented and other related topics. Graded as S/U/F. Crosslisted as: SBHD 690.

HCPR 701. Health Services Research and Policy I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The first course of a two-semester sequence intended to familiarize students with the major players and issues in health care policy, using health reform in the U.S. as a framework through which to analyze the issues of cost, quality and access and to help students develop an independent research proposal. The focus is on the roles of payers, providers and patients in the health care system. This course will be interactive and use studies published in the scientific literature, policy briefs, government reports and textbooks about the health care system as teaching tools. Students will be required to write several short response papers addressing questions related to key issues under health reform as well as develop a research topic and conduct a literature review related to that topic.

HCPR 702. Health Services Research and Policy II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HCPR 701 or permission of instructor. The second course of a two-semester sequence intended to familiarize students with the major health care providers and issues in health care policy and health services in the U.S. The course will mainly focus on health care delivery and quality of care and also introduce the issues of costs and access. The course will be interactive and use studies published in the scientific literature. Students will be required to critique and present research articles related to the topics studied while developing conceptual frameworks, hypotheses and key measures of quality, cost or access for their own research papers.

HCPR 703. Health Economics: Theory and Principles. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A doctoral-level course in health economics with a focus on the theory and principles forming the basis of the field. Students will study foundational theory and research as well as recent applied studies contributing to the current knowledge in the field. Upon completing the course, students should have the theoretical grounding to allow them to frame applied research questions in health economics in terms of past theory and research as well as a sense of where further evidence is needed.

HCPR 720. Economics of Health Disparities. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This doctoral-level survey course is designed to study the causes and consequences of population health disparities from an economic perspective. In addition to studying theories and current approaches from health, labor, public and stratification economics, students will also integrate perspectives from other disciplines, including sociology and psychology. Students will be expected to complete problem sets, in-class presentations and a research paper that will demonstrate the ability to use theoretically grounded approaches to the empirical study of health inequality. After completing this course, students should have an understanding of the economic approaches to health disparities and how to apply these approaches to empirical research.

HCPR 730. Survey Research Methods and Analysis for Health Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 612 or equivalent or permission of instructor. This course is intended to familiarize students with the design and use of surveys for health services research and health policy; to understand the strengths and limitations of health surveys; and to compare and contrast health surveys with other data sources such as administrative records, claims data and electronic medical records. The course is designed to focus more on the applied use of health surveys for research and less on the theoretical aspects of survey and sample design. Class lectures and assignments are designed to guide students incrementally through the actual development and completion of a research project using publicly available survey data.

HCPR 732. Research Design and Proposal Preparation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the design of experimental, quasi-experimental and nonexperimental studies in the healthcare field. Issues related to measurement will be stressed. Specific learning objectives include exploring the methodological issues in health services research; assessing scientific research and casual inference; evaluating a research problem and developing testable hypotheses; conducting data collection and assessing the sampling process; evaluating variable definition in terms of validity and reliability; assessing the various facets of experimental, quasi-experimental and observational designs; and preparing a healthcare research proposal.

HCPR 733. Statistical Methods in Analysis of Healthcare Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 553; ECON 612; and one of BIOS 625, BIOS 631, BIOS 646 or ECON 642; or permission of instructor. Exposes students to large survey and administrative databases that are commonly used in health services research. Students will learn how to organize files, protect data and link databases from multiple sources by applying state-of-the-art deterministic and probabilistic linkage methods. Students will check the quality of merged datasets and learn the advanced techniques used in handling common problems such as missing data, selection bias and handling extreme outliers. Students will also apply the statistical methods that meet the qualities of these data in order to evaluate healthcare interventions and policies. This will be a hands-on course requiring students to download and manipulate data. While the primary emphasis is not on mathematical theory, a certain amount of theoretical background may be presented for some topics.

HCPR 734. Economic Evaluation and Decision Analysis in Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: an introductory course in probability and statistics. Introductory economics is recommended but not required. Introduces doctoral students to the methods, theory and growing range of applications of decision analysis for health care technology assessment, health policy analysis, medical decision-making and health resource allocation.

HCPR 899. Directed Research. 1-9 Hours.
Semester course; 1-3 variable hours. 1-3 credits. Prerequisites: completion of required course work and comprehensive examination. Students are required to conduct and prepare a written dissertation under the guidance of a faculty committee. The dissertation is written in traditional academic style, consists of three papers and must be orally defended. Students must be continually enrolled in this course until the dissertation is successfully completed and approved. A minimum of nine dissertation credits must be taken. Graded S/U/F.

Human and Molecular Genetics (HGEN)

HGEN 501. Introduction to Human Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment by undergraduates students requires permission of instructor. Basic knowledge of genetics is recommended. Provides a comprehensive examination of the fundamentals of human genetics. Explores topics including Mendelian and non-Mendelian inheritance, pedigree analysis, cytogenetics, aneuploid syndromes, cancer, gene structure and function, epigenetics, gene expression, biochemical genetics, and inborn errors of metabolism.

HGEN 502. Advanced Human Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HGEN 501 or equivalent. Enrollment restricted to graduate students. A comprehensive study of the principles of specific areas in human genetics. Explores topics including quantitative genetics, genetic epidemiology, gene mapping, animal models, the characterization of complex disease, diagnostic testing and genetic counseling.

HGEN 510. Classic Papers in Human Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to graduate students in the School of Medicine. This course surveys the seminal discoveries in the discipline of human genetics and introduces students to reading, understanding, discussing, critiquing and presenting original journal articles.

HGEN 511. Human Cytogenetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HGEN 501. A discussion of recent advances in human cytogenetics. Topics covered will include chromosome banding techniques and ultrastructure, meiosis, numerical and structural abnormalities, fragile sites, cancer cytogenetics, methodology for linkage studies, and population cytogenetics. Clinical cases are used to illustrate the application of special diagnostic methodologies.

HGEN 516. Population Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: STAT/BIOS 543. Theoretical and empirical analyses of how demographic and evolutionary processes influence neutral and adaptive genetic variation within populations. Crosslisted as: BIOL 516.

HGEN 517. Introduction to R Programming for Statistical Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open only to graduate students or by permission of course director. This course is to provide and introduction to statistical programming in R. Lectures will provide the fundamentals for efficient handling and exploration of common data set structures in genetic and biomedical sciences.

HGEN 525. Practice of Genetic Counseling. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Enrollment restricted to genetic counseling master's students. Provides context for practice of genetic counseling through literature review and practical techniques. Places specific emphasis on pregnancy and childhood evaluation, interviewing techniques, social and ethical issues, including fieldwork in prenatal, general genetics and specialty clinics.

HGEN 526. Practice of Genetic Counseling. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Enrollment restricted to genetic counseling master's students. Provides context for practice of genetic counseling through literature review and practical techniques. Places specific emphasis on pregnancy and childhood evaluation, interviewing techniques, social and ethical issues, including fieldwork in prenatal, general genetics and specialty clinics.

HGEN 527. Medical Genetics. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisite: HGEN 525-526 or permission of instructor. Enrollment restricted to genetic counseling master's students. Provides medical information and principles of human genetic disease with specific emphasis on the molecular basis of Mendelian disorders, disorders of sexual development, assessment of dysmorphic features, and the genetics of common diseases. Emphasizes the use of all available resource materials in genetics.

HGEN 528. Medical Genetics. 3 Hours.
Continuous courses; 3 lecture hours. 3-3 credits. Prerequisite: HGEN 525-526 or permission of instructor. Enrollment restricted to genetic counseling master's students. Provides medical information and principles of human genetic disease with specific emphasis on the molecular basis of Mendelian disorders, disorders of sexual development, assessment of dysmorphic features, and the genetics of common diseases. Emphasizes the use of all available resource materials in genetics.

HGEN 600. Clinical Genetics. 3 Hours.
Semester course; 1 lecture and 4 laboratory hours. 3 credits. Enrollment restricted to genetic counseling master's students. Practical experience in the genetic counseling clinic and on ward rounds. Includes collection and analysis of family histories, genetic counseling, and introduction to genetic nosology.

HGEN 601. Research in Genetic Counseling. 2 Hours.
Semester course; 1.5 lecture and .5 thesis hours. 2 credits. Enrollment restricted to genetic counseling graduate students only. Students must have chosen their research project adviser, with whom they will meet throughout the semester, prior to enrolling. Provides a comprehensive examination of the fundamentals of research relevant for the scientific advancement of the genetic counseling field. Explores topics including developing a research question; conducting literature reviews; designing a research project; working with the institutional review board; and collecting, analyzing and interpreting data. Students will develop and deliver a research proposal orally and in writing.

HGEN 602. Genetic Models of Disease. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Understanding the molecular basis of human disease states is a major focus for biomedical research. This course will train students to investigate molecular-genetic mechanisms of disease using four genetic model organisms: the nematode C. elegans, the fruit fly Drosophila melanogaster, the teleost zebrafish Danio rerio and the mouse Mus musculus, which serve as important laboratory models for human diseases and facilitate the elucidation of the underlying molecular mechanisms.

HGEN 603. Mathematical and Statistical Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 543 and BIOS 544; CCTR 702 and 703; or equivalents or permission from the course director. Provides an introduction to the rudiments of theoretical and applied mathematical population genetics including the segregation of genes in families, genetic linkage and quantitative inheritance. Emphasizes the methods used in the analysis of genetic data.

HGEN 605. Experimental Methods in Human Genetics. 1-3 Hours.
Semester course; 2-6 laboratory hours. 1-3 credits. Restricted to students in the M.S. or Ph.D. programs in human genetics. Provides hands-on experience with the experimental methods that are used to carry out research in specific areas of human genetics prior to beginning thesis/dissertation research. Graded S/U/F.

HGEN 606. Introduction to Clinical Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: open only to graduate students in human genetics programs or by permission of instructor. Provides an overview of medical genetics and counseling practice for non-genetic counseling students, including orientation to the translational side of research genetics and contemporary practice of clinical genetics. Graded S/U/F.

HGEN 607. Processes in Genetic Counseling I. 1 Hour.
Semester course; 1 practicum hour. 1 credit. Enrollment restricted to students in the genetic counseling program. Training in the ability to recognize the psychological and social processes affecting counselor-patient interactions. Graded as pass/fail.

HGEN 608. Processes in Genetic Counseling II. 1 Hour.
Semester course; 1 practicum hour. 1 credit. Prerequisite: HGEN 607. Enrollment restricted to second-year students in the genetic counseling program. Further training in the ability to recognize the psychological and social processes affecting counselor-patient interactions. Graded as pass/fail.

HGEN 610. Current Literature in Human Molecular Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: open only to graduate students. Provides directed experience in critiquing, understanding and presenting current literature on a focused topic in molecular genetics. Graded as S/U/F.

HGEN 611. Data Science I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course will introduce students to tools and techniques from the discipline of data science that support efficient and reproducible scientific computing. Students will gain hands-on experience developing complete data analysis projects based on real-world datasets. Lessons will cover the primary tasks that comprise most analyses: data management/acquisition, cleaning, reshaping, manipulation, analysis and visualization, as well as strategies for arranging these constituent parts into cohesive workflows that are verifiable, easily repeatable and consistent with best practices for reproducible computational research. This course will focus on the statistical programming language R but no programming background is necessary.

HGEN 612. Data Science II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HGEN 611. This course builds upon the material introduced in the prerequisite and introduces advanced techniques for working with data and producing highly reproducible research. Students will expand their data science toolbox to include the Unix-based command-line environment and associated applications for manipulating data, automating workflows and recording incremental changes to research materials. Students will also dive deeper into R, learning more sophisticated programming methods for solving a wide variety of research-related challenges and placing more emphasis on programming technique -- writing code that is robust, expressive and modular --culminating in the development of their own R packages, which allows other scientists to benefit from this work.

HGEN 614. Pathogenesis of Human Genetic Disease. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to graduate students. Surveys the mechanisms and varieties of human gene mutations resulting in human genetic disease and emphasizes different investigational disorders using current scientific literature.

HGEN 615. Techniques in Genetic Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students in the M.S. in Genetic Counseling program or by permission of the instructor. Provides theory and context for interviewing as well as counseling skills required for genetic counseling practice. Literature and practical techniques utilized to acquire skills. There is significant reliance on live in-class role play scenarios to exercise and demonstrate emerging skills. Additional deconstruction of taped master genetic counselor role plays aids in the understanding and evaluation of theory and skill to be acquired. Emphasis is on understanding and developing the verbal and non-verbal skills required for effective genetic counseling practice.

HGEN 617. Genetic Analysis of Complex Traits. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: introductory biostatistics or permission of instructor. Introduces the theory and practice of analysis of complex human traits. Provides a solid grounding in the fundamental concepts, study designs and analytical strategies for this evolving and important area.

HGEN 619. Quantitative Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The effects of genes and environment on complex human traits with emphasis on: Genetic architecture and evolution; nongenetic inheritance; mate selection; developmental change; sex-effects; genotype-environment interaction; resolving cause from effect; design of genetic studies, statistical methods and computer algorithms for genetic data analysis.

HGEN 620. Principles of Human Behavioral Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The theory of genetic and nongenetic transmission considered in relation to the design, analysis, and interpretation of studies to identify the principal genetic and environmental causes of behavioral variation. Included will be analysis of intelligence, personality, social attitudes, and psychiatric disorders.

HGEN 622. Cancer Genetic Counseling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: HGEN 501-502 or permission of instructor. Provides a background in as well as the most current information relevant to cancer genetics and cancer genetic counseling. Includes instruction in basic science and genetic and psychosocial aspects of cancer, with an emphasis on familial and hereditary cancers.

HGEN 631. Advanced Dental Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment is limited to students in the DDS program. A 1 credit hour course on topics in human genetics with application to clinical dentistry.

HGEN 690. Genetics Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Selected topics in genetics presented by students and staff.

HGEN 691. Special Topics in Genetics. 1-4 Hours.
1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training.

HGEN 692. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

HGEN 697. Directed Research in Genetics. 1-15 Hours.
1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.

Interdisciplinary Biomedical Sciences (IBMS)

IBMS 600. Laboratory Safety. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Describes health hazards commonly found in biomedical laboratories and their appropriate safety precautions, government regulations and emergency responses. Includes hazards of working with micro-organisms, experimental animals, and chemical, electrical and fire hazards. Graded as S/U/F.

IBMS 610. Laboratory Opportunities. 0.5 Hours.
Semester course; 0.5 credits. A concentrated presentation of the programs and research opportunities available to doctoral students in the School of Medicine. Graded as S/U/F.

IBMS 620. Laboratory/Clinical Rotations. 2 Hours.
Semester course; 2 credits. Students conduct laboratory and/or clinical rotations to gain direct exposure to individual SOM projects. Graded S/U/F.

IBMS 630. Critical Thinking. 1 Hour.
Semester course; 1 credit. Paper presentations and discussions of important topics in biomedical science.

IBMS 635. Cellular Signalling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOC 503/504 with minimum grade of B, or permission of instructor. An interdisciplinary introduction to molecular mechanisms important in eukaryotic inter- and intracellular signaling. Topics covered: common signaling mechanisms (heterotrimeric G proteins and G-protein-coupled receptors, small G proteins, tyrosine kinases and MAP kinases, and ion channels), membranes, lipids and ions (calcium signaling, phosphoinositols and lipid signaling through GPCRs), immune and metabolic kinase cascades (AMP-activated kinase, NFκB and Jak/Stat pathways), and programmed cell death.

IBMS 680. Proposal Preparation. 1 Hour.
Semester course; 1 credit. Preparation of an NIH-style grant proposal to serve as the oral component of the Ph.D. qualifying examination. Graded S/U/F.

IBMS 690. Basic Health Sciences Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Faculty and/or visiting lecturers present current research in basic health sciences. Students attend 12 seminars per semester in any of the basic health science or clinical departments in the School of Medicine and submit a one-paragraph (approximately 100-word) summary description of the seminar. Graded S/U/F.

IBMS 691. Special Topics in Interdisciplinary Biomedical Sciences. 0.5-4 Hours.
Semester course; variable hours. 0.5-4 credits. Lectures, seminars, tutorial sessions, Web-based courses and/or library research assignments in selected areas not available in other graduate-level courses or as a concentrated emphasis on a particular topic. Graded as S/U/F.

IBMS 692. Special Topics in Interdisciplinary Biomedical Sciences. 0.5-4 Hours.
Semester course; 0.5-4 variable hours. 0.5-4 credits. Lectures, seminars, tutorial sessions, Web-based courses and/or library assignments in selected areas not available in other graduate-level courses or as a concentrated emphasis on a particular topic.

International Program in Addiction Studies (IPAS)

IPAS 600. The Biological Basis of Addiction. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Designed to provide an overview of the neuropharmacology of drugs of abuse and dependence, including basic principles of drug action as well as comprehensive coverage of the major classes of drugs (opioids, stimulants, nicotine, alcohol, sedatives, cannabis, hallucinogens). Students will study mechanisms of action, effects, pharmacokinetics as well as tolerance and dependence for each of these drugs/drug classes. The reasons for addiction including biological, genetic, cultural and other determinants will be discussed. Laboratory-based methods used in addiction research will be covered.

IPAS 601. Treatment of Addiction: Psychosocial Interventions. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Designed to explore the scientific basis and treatment of substance misuse from a psychological perspective germane to the management of drug, alcohol and nicotine dependence. Students will have the opportunity to evaluate the principles of different theoretical approaches underlying psychological assessment and evidence-based practice. Students will develop a critical awareness of the current literature related to psychological theories of addiction. Students will examine the use and comparative efficacy of different psychological therapies in clinical practice including brief interventions, cognitive behavioral therapy and motivational interviewing/MET. Other interventions (case management, group work, self-help, integrated treatment for co-occurring disorders, etc.) will also be examined along with the evidence base for relapse prevention, contingency management and therapeutic communities. Students will also have the opportunity to explore psychological approaches used with specialist populations such as young people and adolescents.

IPAS 602. Public Health Issues and Approaches to Addictions. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Provides an introduction to basic concepts and research methods in public health and epidemiology as they relate to the study of addictions, as well as an in-depth consideration of the personal, social, economic and cultural burdens/costs associated with drug and alcohol abuse and dependence. Individual and community-based risk and protective factors related to addictions, as well as primary and secondary prevention efforts aimed at reducing the addictions-related public health burden, also are a focus. An online lecture format featuring presentations by leading researchers and policy-makers in the field of addictions will be used, along with readings, online discussions and writing assignments, to (1) gain a greater understanding of the enormous costs of addictions at every level of society and (2) introduce students to some of the current thinking and programs related to the primary and secondary prevention of addictions.

IPAS 603. Addiction Policy. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Designed to provide students of differing backgrounds an understanding of the process by which international addiction health policy is formed and reformed around the use and misuse of both licit and illicit drugs. The course will look at the epidemiology of addiction around the world and the relationship between the burden of addiction and the corresponding effects of national and international drug policies.

IPAS 604. Treatment of Addiction: Pharmacotherapies. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Designed to provide an overview of the pharmacological management of alcohol and drug addiction. Covers the management of withdrawal from alcohol, sedatives, opioids, cannabis and stimulants, as well as long-term management of dependence on opioids, tobacco and alcohol. Additional topics include international perspectives on management of dependence, management of dependence during pregnancy and the process of medication development.

IPAS 605. Treatment of Addiction: Critical Issues. 4 Hours.
11-week online course; 4 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies), graduate certificate program in addiction studies or with permission of the IPAS program director. Designed to enable students to gain advanced understanding of the critical issues involved in the identification, recruitment, assessment, diagnosis and classification of individuals who misuse substances. Local, national and international barriers to treatment (stigma, culture, religion, politics, legal issues, civil commitment, cost, attitudes and beliefs) will be considered. Students will explore and critically examine treatment options in special settings (for instance, prisons, criminal justice and employment) and in special populations (for instance, addicted health care professionals, co-morbid patients, pregnancy).

IPAS 606. Research Methodology in Addictions. 6 Hours.
11-week online course; 6 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies). Designed to enable students to develop knowledge and understanding of the different methodological processes underpinning research in the addictions. The research principles involved in hypothesis testing and estimation procedures will be covered as well as the generic skills necessary to analyze data and interpret statistical findings. Basic epidemiological study designs, policy analysis and inferential statistical methods pertinent to the addictions field will be explored.

IPAS 692. Research Project in Addictions. 6 Hours.
12-week intensive online course; 6 lecture hours. 6 credits. Open only to students in the International Program in Addiction Studies (Master of Science in Addiction Studies). Students will be required to complete a research project under the supervision of IPAS faculty. The submitted written text will be a minimum of 10,000 words in length and must demonstrate a critical knowledge of the chosen topic area. The ability to apply scientific scrutiny to a topic related to aspects of drug and alcohol etiology, treatment, prevention, public health or policy as identified by the program team will be required. The research project may involve original data collection, secondary analysis of previously collected data sets or other quantitative or qualitative research methods. The necessary defining feature is that the research project should demonstrate an appropriate level of academic rigor and understanding of the scientific implications of the findings of the project. Students will need to demonstrate competence in the integration and analysis of data to further the translation of this knowledge into more effective policies and practices, in keeping with the stated aims of the program. Graded S/U/F.

Medical Physics (MEDP)

MEDP 520. Introduction to Radiation Therapy Physics Laboratory. 1 Hour.
Semester course; 2 laboratory hours. 1 credit. Provides practical exercises in the radiation measurement devices and quality assurance procedures commonly employed in radiation therapy physics. Measurements of beam characteristics for treatment machines, including electron linear accelerators, and radioactive sources, including high dose rate brachytherapy are investigated.

MEDP 561. Topographical Anatomy and Physiology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Restricted to medical physics graduate students. This course will cover fundamental gross anatomy, pathology and physiology as necessary for medical physicists. It will include basic medical terminology and have a focus on cross-sectional CT imaging and MRI, as well as 2-D X-ray imaging. Basic information on pathophysiology of cancer diseases and cancer treatment strategies will be provided.

MEDP 563. Radiological Physics and Radiation Dosimetry. 4 Hours.
Semester course; 3 lecture and 1 laboratory hours. 4 credits. Prerequisites: Equivalent of PHYS 376 and PHYS 380 or permission of instructor. Covers the fundamental conceptual, mathematical and physical aspects of radiation interactions with matter and energy deposition, including a thorough understanding of basic quantities and units. Application to the principles and methods of radiation detection and dosimetry will be emphasized.

MEDP 567. Introduction to Radiation Therapy Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the fundamental conceptual and technical aspects of the use of ionizing radiation to evoke a therapeutic response/benefit to patients. Treatment planning and dose calculations for external beam radiation therapy and brachytherapy are emphasized.

MEDP 591. Special Topics in Medical Physics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Open to graduate students and to undergraduate students with advanced standing. An in-depth study of a selected topic in medical physics. See the Schedule of Classes for specific topics to be offered each semester and prerequisites. Applicable toward physics major requirements.

MEDP 592. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training.

MEDP 601. Health Physics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Theoretical foundation and practical application of health physics as applied to diagnostic radiology, nuclear medicine and radiation therapy. Regulatory and scientific aspects of the subject are covered. Mathematical models and physical principles of radioactive decay and radiation interactions are used to assess the relative values of different radiation safety practices.

MEDP 630. Radiobiology for the Medical Physicist. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the fundamental aspects of radiobiology with specific emphasis on relative biological effectiveness and linear energy transfer, the oxygen effect, radiation carcinogenesis, DNA repair, hereditary effects of radiation, radiation-induced cell killing, cellular responses to radiation including cell cycle effects and activation of cell signal transduction pathways, early and late effects of radiation, and time, dose and fractionation in radiotherapy.

MEDP 633. Advanced Radiation Therapy Physics. 4 Hours.
Semester course; 3 lecture and 2 laboratory hours. 4 credits. Prerequisites: PHYS 563 and PHYS 567 or instructor's permission. The course presents a survey of modern developments and methodological tools used in the following areas of radiation oncology physics: experimental dosimetry, computational dosimetry, quality assurance and commissioning, and advanced treatment planning and delivery modalities. By means of hands-on projects and literature reviews, students will become acquainted with the medical physics literature and acquire practical skills in selected areas. The course consists of a coordinated set of didactic lectures and laboratory projects.

MEDP 635. Physics of Diagnostic Imaging. 3 Hours.
Semester course; 3 lecture and 1 laboratory hours. 3 credits. Covers the physics of X-ray production, radiography, fluoroscopy and computed tomography. Covers the basics of ultrasound physics, equipment, image quality, safety and quality assurance. Emphasis will be placed on the physical foundations of currently used diagnostic imaging techniques using X-rays and ultrasound and their relevance to the clinical setting.

MEDP 636. Physics of MRI. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the physics of magnetic resonance imaging. Emphasis will be placed on the physical foundations of currently used diagnostic techniques and their relevance to the clinical setting. The classroom lectures will be enhanced through a series of integrated laboratory exercises.

MEDP 637. Physics of Nuclear Medicine. 2 Hours.
Semester course; 2 lecture and 1 laboratory hours. 2 credits. Covers the physics of nuclear medicine imaging (including PET). Emphasis will be placed on the physical foundations of currently used diagnostic techniques and their relevance to the clinical setting.

MEDP 682. Clinical Rotations in Medical Physics. 1-3 Hours.
Semester course; variable hours. 1-3 credits. May be repeated for credit. Prerequisites: at least one graduate medical physics course and permission of instructor. Clinical rotations in various medical physics sub-specialties.

MEDP 689. Medical Physics Literature Review. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Review and discussion of relevant journal articles from the medical physics literature. May be repeated for credit with instructor's permission.

MEDP 697. Directed Research. 1-15 Hours.
Semester course; 1-15 credits. May be repeated for credit. Prerequisites: at least one graduate-level physics course and permission of instructor. Research leading to the M.S. or Ph.D. degree.

Microbiology and Immunology (MICR)

MICR 501. Infection and Immunity (Pharmacy). 4 Hours.
Semester course; 4 lecture hours. 4 credits. Offered to pharmacy students in the first professional year. Others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry and pharmacy.

MICR 505. Immunobiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Background in cellular and molecular biology, and biochemistry is recommended. Nondegree-seeking students admitted with permission of instructor. A survey of immunobiology as a total host response to foreign agents, covering the nature of antigens and antibodies, antigen-antibody reactions, immunocompetent cells, allergic reactions, tumor immunology, transplantation immunology, immunological diseases and immunogenetics.

MICR 513. Infection and Immunity (Dentistry). 4 Hours.
Semester course; 4 lecture hours. 4 credits. Offered to dental students in the first professional year. Others admitted with permission of instructor. A course on the fundamentals of microbiology and immunology with aspects on disease and treatment of interest to dentistry and pharmacy.

MICR 515. Principles of Molecular Microbiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive course designed to provide the student with a thorough understanding of microbial physiology, genetics and diversity. Also covered are some basic concepts in microbial pathogenesis and in applied microbiology. The course focuses on structural and functional characteristics of micro-organisms; ecological and physiological diversity of microbes; growth and control of micro-organisms; genetics of bacteria and viruses; bacteria as agents of disease; and applications of microbiology.

MICR 605. Prokaryotic Molecular Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOC 530, BIOC 531, BIOC 532 and BIOC 533; or BIOC 503 and BIOC 504; or permission of instructor; MICR 515 or equivalent recommended. A comprehensive introductory course examining the organization of the genetic material in bacteria and their viruses and the molecular mechanisms involved in its maintenance, replication, exchange and expression. Emphasis will be on experimental approaches integrating classical and modern methods of genetic analysis with biochemical studies of genetic regulatory mechanisms.

MICR 607. Techniques in Molecular Biology and Genetics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: BIOC 530, BIOC 531, BIOC 532 or BIOC 533; or BIOC 503 and BIOC 504 or equivalent; permission of instructor. Designed to give an overview of the techniques utilized in modern molecular biology. The principles underlying techniques such as plasmid and phage cloning, RNA and DNA analysis, PCR, DNA sequencing, mutagenesis, genomic mapping, heterologous gene expression, and production and analysis of recombinant protein and transgenic mouse technology will be discussed in detail by experts in the field.

MICR 608. Introduction to Microbiology and Immunology Research. 3 Hours.
Continuous courses; lectures and 4 laboratory hours. 3-3 credits. Prerequisite: Permission of instructor. Required of all first-year graduate students. Introduction to all active research programs in microbiology and immunology. Presentations of research programs by investigators and rotation of students through faculty laboratories to gain direct exposure to individual research projects.

MICR 609. Introduction to Microbiology and Immunology Research. 3 Hours.
Continuous courses; lectures and 4 laboratory hours. 3-3 credits. Prerequisite: Permission of instructor. Required of all first-year graduate students. Introduction to all active research programs in microbiology and immunology. Presentations of research programs by investigators and rotation of students through faculty laboratories to gain direct exposure to individual research projects.

MICR 616. Mechanisms of Viral and Parasite Pathogenesis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A comprehensive introduction to the basic principles of virology and human parasitology. Interactions of the infecting agents and hosts will be stressed at the molecular and cellular level.

MICR 618. Molecular Mechanisms of Bacterial Pathogenesis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: undergraduate-level courses in microbiology or microbial physiology, immunology and molecular genetics. The goals of this comprehensive course are to explore in detail the virulence mechanisms of microbes and the response of the infected host. The focus will be on important bacterial pathogens.

MICR 653. Advanced Molecular Genetics: Bioinformatics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Cell/molecular biology or permission of instructor. An advanced course on contemporary bioinformatics. Topics covered include the principles and practice of DNA, RNA and protein sequence analysis, computational chemistry and molecular modeling, expression array analysis and pharmacogenomics. The course includes lectures, reading, computer lab, homework problem sets and projects. Crosslisted as: BNFO 653.

MICR 684. Molecular Biology of Cancer. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOC 530, BIOC 531, BIOC 532 and BIOC 533; or BIOC 503; or permission of instructor. Advanced graduate-level course to provide theoretical background to graduate students interested in cancer research. Emphasis will be placed on experimental approach integrating classical and modern methods of genetic analysis with biochemical studies in genetic regulatory mechanisms. The course includes presentations by students and interactive discussion of the scientific literature in the area of oncogenesis.

MICR 686. Advanced Immunobiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open primarily to residents, medical students and graduate students with an immunology background such as MICR 505. Lectures, seminars, conferences on basic and clinical immunobiology and literature review on the topic, with more emphasis on methods in immunology research and exercising the ability to communicate the topic verbally. Topics have included tumor immunology, cell interactions in the immune response, genetics of the immune response, mechanisms of host-defense and membrane receptors in immunology and neoplasia.

MICR 690. Microbiology Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of research reports and topics of current interest to the departmental seminar or special group seminars.

MICR 691. Special Topics in Microbiology. 1-4 Hours.
Semester course; 1-4 credits. Lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training.

MICR 692. Current Topics in Molecular Pathogenesis. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to all graduate and certificate students. Presents a forum for the discussion of recent advances in the study of the molecular mechanisms of microbial pathogenesis. Consists of presentations by students, postdoctoral fellows and faculty followed by interactive discussions of the implications of presented work to the study of molecular pathogenesis.

MICR 693. Topics in Molecular Biology and Genetics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to all graduate students. Presents a forum for discussion of the scientific literature in the area of molecular biology and genetics, focusing on molecular mechanisms involved in regulation of gene expression and cell growth with examples from all three kingdoms of life. Consists of presentations by students and interactive discussions of the implications of presented work to the study of molecular biology.

MICR 694. Current Topics in Immunology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to all graduate students. Presents a forum for discussion of the scientific literature in the area of cellular and molecular immunology, focusing on mechanisms involved in the operation and regulation of the vertebrate immune system. Consists of presentations by students and interactive discussions of the implications of presented work to the study of immunology.

MICR 695. Special Topics in Microbiology. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

MICR 697. Directed Research in Microbiology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective research projects for other students.

Neurosciences (NEUS)

NEUS 609. Cellular and Molecular Neuroscience. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Recommended preparation: BIOC 503-504 or equivalent. Designed as an interdisciplinary introduction to the cellular and molecular aspects of central nervous system function. The basic principles of neuroscience including neuronal structure, electrical properties of single neurons, cell biology of neurotransmitter release and postsynaptic function will be discussed, followed by intracellular signaling in neurons, gene regulation, transgenic model systems, glia, neuronal development, basic neurochemistry, and molecular and cellular aspects of motor, sensory and integrative function. The course will conclude with lectures on various aspects of neural injury and disease, including traumatic brain injury, Parkinson's and Alzheimer's diseases.

NEUS 619. Synaptic Organization of the Brain. 3 Hours.
Semester course; 4 lecture and laboratory hours. 3 credits. Prerequisite: ANAT 610 or equivalent and permission of instructor. Designed to provide an in-depth integrative examination of the neural circuitry underlying the functions of selected regions of the brain and spinal cord. During each class meeting, faculty present lectures followed by an oral presentation by a student. Lecturers will highlight principles that are common to all regions of the central nervous system as well as adaptations that are unique to each. Student also complete weekly take-home essay assignments.

NEUS 640. Neurobiology of CNS Diseases. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Background in cellular and systems neuroscience similar to NEUS 609 and ANAT 610 or consent of course director. The course explores the cellular and molecular basis of major diseases and conditions affecting the central nervous system as well as current and developing treatment strategies and translational approaches. Topics include stroke and cerebrovascular disease, neurotrauma and regeneration, epilepsy, neurodevelopmental disorders, neurodegenerative disease and dementia, demyelinating diseases, neuropsychiatric disorders and autism, neurooncology, and neuroAIDS.

NEUS 690. Neuroscience Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Consists of faculty and visiting lecturers presenting current research in neuroscience. Students attend one seminar per week and submit a one-page summary description of the seminar. Graded as S/U/F.

NEUS 697. Directed Research. 1-15 Hours.
Semester course; variable hours. 1-15 credits. Research leading to the Ph.D. degree and elective research for other students. Graded as S/U/F.

Pathology (PATH)

PATH 521. Laboratory Techniques in Diagnostic Pathology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This team taught course includes principles of automated and non-automated testing, diagnostic testing, and an active laboratory demonstration of each method.

PATH 540. Pathology for Allied Health Sciences. 2 Hours.
Semester course; 1.5 lecture and 1 laboratory hours. 2 credits. Explores morbid tissue changes involved in selected disease states, with emphasis on musculoskeletal and nervous systems. Provides the foundation to understanding clinical problems that physical therapists and other paramedical personnel will encounter and treat in their patients.

PATH 590. Experimental Pathology Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit.

PATH 601. General Pathology (Dentistry). 6 Hours.
Semester course; 6 lecture hours. 6 credits. Instruction in the basic principles regarding alteration of structure and function in disease and in the pathogenesis and effect of disease in the various organ systems.

PATH 620. Special Topics in Modern Instrumental Methods. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. A study of some of the modern research methods of molecular biology. The student gains experience with the technique concomitant with discussions with faculty. The student writes a comprehensive review of the technique studies.

PATH 670. Experimental Approaches to Tumor Biology. 3 Hours.
Semester course; 3 lecture/discussion hours. 3 credits. Introduces central problems in tumor biology and the methods available for their study. Develops through lectures and presentations skills in critical review and interpretation of research reports.

PATH 690. Clinical Chemistry Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Graduate students, residents, and staff present topics of current interest in clinical chemistry.

PATH 691. Special Topics in Modern Instrumental Methods. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. By special arrangement with instructor. A study of some of the modern research methods of molecular biology. The student gains experience with the technique concomitant with discussions with faculty. The student writes a comprehensive review of the technique studied.

PATH 697. Research in Pathology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to Ph.D. degree and elective research projects for other students.

Pharmacology and Toxicology (PHTX)

PHTX 515. Pharmacology for Nurse Anesthetists I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The basic principles of pharmacology including mechanisms of absorption, distribution, biotransformation, elimination, dose-response relationships, drug and receptor interactions are presented followed by a detailed discussion of autonomic, cardiovascular, and renal pharmacology as it relates to nurse anesthesia. Detailed presentation of the pharmacology of classes of drugs used by nurse anesthetists will be made, with emphasis on general anesthetics.

PHTX 516. Pharmacology for Nurse Anesthetists II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 515. Detailed presentation of the pharmacology of classes of drugs used or encountered by nurse anesthetists will be made with emphasis upon local anesthetics, cardiovascular, chemotherapeutic, and anti-inflammatory agents. Continuation of PHTX 515.

PHTX 535. Introduction to Toxicology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. The basic principles of toxicology and toxicological evaluations; correlations of toxicological responses with biochemical, functional and morphological changes; environmental (including occupational and public health), forensic and regulatory concerns; and risk assessment and management are presented for graduate students in the biomedical sciences.

PHTX 536. Principles of Pharmacology and Toxicology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. Prerequisite: permission of instructor. A comprehensive course in pharmacology for graduate students. The mechanisms of action of major classes of pharmacologically active agents and basic principles of pharmacology are discussed. Topics include drug absorption, distribution, and metabolism; chemotherapy; endocrine pharmacology and principles of toxicology/immunotoxicology.

PHTX 537. Principles of Pharmacology and Toxicology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. Prerequisite: PHTX 536 or with permission of instructor. Topics include receptor theory, autonomic, cardiovascular, and central nervous system pharmacology and toxicology. Continuation of PHTX 536.

PHTX 548. Drug Dependence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: graduate or post-baccalaureate standing. A broad survey course in problems of drug and alcohol use and abuse. It will focus on the pharmacology of abused drugs as well as a study of the psychological and sociological factors in drug-taking behavior, rehabilitation methods, and prevention. This course may not be taken in lieu of any pharmacology offerings in the professional schools on the MCV Campus.

PHTX 597. Introduction to Pharmacological Research. 1-12 Hours.
Semester course; 1-12 credits. Prerequisite: permission of instructor. Rotation research in pharmacology and toxicology laboratories for beginning graduate students.

PHTX 606. Introduction to Pharmacology of Therapeutic Agents. 1 Hour.
Module course; 1 lecture hour. 1 credit. The basic principles of pharmacology and an in-depth consideration of the biodisposition and mechanisms of action of these agents. Drugs acting on the autonomic system are covered.

PHTX 609. General Pharmacology and Pain Control. 4 Hours.
Semester course; 2 lecture hours per week for 2 semesters. One grade for 4 credits at end of second semester. A two-semester course that covers the study of the effects of chemical agents on the structure and function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes.

PHTX 611. Dental Pharmacology and Pain Control. 2 Hours.
Semester course; 2 lecture hours per week. 2 credits. Offered for the D-3 students who have successfully completed PHTX 609. A continuation of PHTX 609. The study of the effects of chemical agents on the structure and/or function of living tissues, which may be normal or pathological. Provides a basic understanding of pharmacological principles and the basic concepts of currently accepted theories of pain mechanisms and provides a scientific basis for the use of therapeutic agents in order that the future dentist will be able to safely administer drugs to control pain by parenteral, oral or inhalation routes. PHTX 611 differs from PHTX 609 in that the material presented is more clinical in content and more classes involve clinical correlates of the didactic material presented.

PHTX 614. Foundation in Psychoneuroimmunology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: at least one graduate-level course in immunocompetence, pharmacology, physiology, immunology, biochemistry or psychology, or permission of instructor. This course will provide an in-depth overview of how brain and immune systems interact to maintain physiological and biochemical steady-states essential to wellness. Theory and research drawn from neuroscience, immunology and psychology will be examined as a foundation for understanding mind-body relationships. Beginning at the cellular level, fundamental information underlying mutually interact neuroendocrine-immune system functions will be synthesized to inform an understanding of wellness as well as a variety of pathophysiological states related to the stress process.

PHTX 620. Ion Channels in Membranes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Previous course work including basic concepts in electrophysiology, such as those covered in PHIS 501 or PHTX/PHIS/ANAT 509, is highly recommended. Detailed presentation of the fundamental biophysical properties of ionic channels in membranes including the elementary properties of pores, molecular mechanisms of ionic selectivity, mechanisms of drug block, structure-function relationships, and basis for channel gating. Discussion will encompass modern techniques for studying ion channel function. Crosslisted as: PHIS 620.

PHTX 625. Cell Signaling and Growth Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 536 or consent of instructor. Covers biochemical and molecular biology approaches to pharmacological problems. Emphasizes signal transduction, oncogenes, protein kinases, stress responses and the control of cellular proliferation.

PHTX 630. Basic Concepts in Pharmacology for Graduate Students. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOC 503 or permission of instructor. This course provides basis for drug-receptor theory, quantitative understanding of drug-receptor interaction, drug-receptor-based signaling, in-vivo application of drug-receptor theory, pharmacokinetics and statistical treatment of drug-receptor interaction in pharmacology and toxicology.

PHTX 632. Neurochemical Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 536 or permission of instructor. Investigates the mechanisms of drugs acting on the central nervous system in relation to their effects on endogenous neurochemical systems. Examines the milieu in which drugs act upon the central nervous system, experimental techniques frequently used in neuropharmacology, specific neurotransmitter systems, as well as the mechanisms of action of specific drugs.

PHTX 633. Behavioral Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This is a survey course covering research on the effects of drugs on behavior. The major emphasis will be on schedule-controlled learned behavior. Additional topics will include drug self-administration, drug discrimination, and conditioned drug effects and behavioral toxicology. The course focuses primarily on laboratory research in animals although human research will also be covered. The relevance of this research literature to drug treatment of behavioral disorders and substance abuse will be discussed.

PHTX 636. Principles of Pharmacology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. Prerequisite: PHTX 630 or permission of instructor and graduate program director. Corequisite: PHTX 639. A comprehensive course in pharmacology for graduate students. The mechanisms of action of major classes of pharmacologically active agents and basic principles of pharmacology are discussed. Topics include autonomic and cardiovascular pharmacology; CNS pharmacology; pharmacology of antimicrobials and cancer; gastrointestinal and endocrine pharmacology.

PHTX 638. Cellular Mechanisms of Toxicology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 536 or permission of instructor. A holistic approach is taken to describe and analyze toxicological information. Intact animal, organ, cellular, and biochemical responses to toxic agents are presented. Immunologic, genetic, endocrine, and central nervous system paradigms and their relationship to the mechanism of action of toxic agents as well as the predictive value of tests of these systems are presented. Kinetics and metabolism of toxic agents as well as statistical and analytical procedures are integrated into the discussions.

PHTX 639. Principles of Pharmacology Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: PHTX 630 or permission of instructor. Corequisite: PHTX 636. This course will be in journal club format run in parallel with PHTX 636. Journal club articles pertaining to drug classes and their mechanism of action will be presented by students. Topics include autonomic, CNS, endocrine, cardiovascular and cancer pharmacology.

PHTX 644. Forensic Toxicology. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Lecture and demonstrations in which common poisons and groups of poisons are discussed as to detection, diagnosis and treatment of poisoning. Demonstrations include basic principles of analytical toxicology, forensic science and courtroom testimony. Crosslisted as: FRSC 644.

PHTX 690. Pharmacology Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Members of the departmental staff, students, and visiting lecturers participate in discussions on topics of current and historical interest.

PHTX 691. Special Topics in Pharmacology. 1-4 Hours.
Semester course; 1-4 credits. Prerequisite: permission of instructor. Special topics in pharmacology or toxicology covered in less detail in other courses will be studied in depth in this course.

PHTX 692. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

PHTX 697. Directed Research in Pharmacology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective projects for other students.

Physiology and Biophysics (PHIS)

PHIS 501. Mammalian Physiology. 5 Hours.
Semester course; 5 lecture hours. 5 credits. A comprehensive study of the function of mammalian organ systems at the organ, cell and molecular level, designed for graduate and professional students. Successful students typically have high achievement in intermediate-level undergraduate biology, chemistry and physics.

PHIS 502. Physiology and Pathophysiology (Dentistry). 5 Hours.
Semester course; 5 lecture hours. 5 credits. Prerequisites: biology, chemistry and physics. A comprehensive study of the function of mammalian organ systems, designed primarily for dental students.

PHIS 512. Cardiac Function in Health and Disease. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501 or permission of instructor. A comprehensive study of cell and system cardiovascular physiology with pathophysiological implications, primarily designed for professional students.

PHIS 514. Cardiovascular Hemodynamics. 2 Hours.
Semester course; 30 lecture/lab hours. 2 credits. Prerequisite: PHIS 501. Emphasizes the pathophysiological implications of cardiovascular hemodynamics. The rationale and principles of a variety of clinical and paraclinical examination methods used in cardiology will be studied and demonstrated. The pathophysiology of some of the major cardiovascular diseases will be explained by specialists.

PHIS 604. Cell Physiology: Cardiovascular and Respiratory. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501. Enrollment restricted to Ph.D. and M.S. students. This research-oriented course covers topics such as the cellular, molecular and structural bases for cardiovascular and pulmonary function, including detailed analyses of the behavior and regulation of diverse types of transmembrane ion channels at the molecular and cellular level; detailed studies of oxygen delivery by microcirculation; mechanisms of ischemia-reperfusion injury, novel cardio-protection strategies and heart failures; cholesterol homeostasis by macrophages in coronary artery disease; and airway inflammation and mucus secretion as a model for drug development.

PHIS 606. Molecular Basis for Disease. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Topics covered include an introduction to structure of macromolecules and biophysical methods of protein determination. The second part of the course includes research topics such as gene regulation, protein folding and ribosome biogenesis. The third section includes ion channel structure and function. Each section includes problem sets that students are required to complete, three exams and a written mini-grant chosen from the topics discussed in class.

PHIS 607. Cell Physiology: GI and Endocrine. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501. This course focuses on physiology at the levels of individual molecules, cells, organs and entire organisms. Molecular mechanisms, regulatory processes and diseases processes are considered. The course is designed for research-oriented students and focuses on taste, gut, intestines, endocrine and reproductive systems and is structured around the ongoing research activity of the participating faculty.

PHIS 612. Cardiovascular Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501. An in-depth study of the original literature in selected areas of cardiovascular physiology.

PHIS 615. Signal Detection in Sensory Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHIS 501 or permission of instructor. An in-depth study of cells and cell systems that serve as either internal or external environmental sensors. Topics will emphasize the physiology, anatomy and the biochemistry of mature sensing systems, the systems in normal development and their plasticity toward stresses during development or in maturity.

PHIS 619. Mitochondrial Pathophysiology and Human Diseases. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Mitochondria are essential for eukaryotic life energy production in an oxygen environment, extensively modulate intracellular calcium signaling, are the major source of damaging oxygen free radicals, control activation of cell death pathways and are now known to be impaired in many human diseases of aging. For all these reasons, understanding mitochondrial physiology is essential for graduates of biomedical research programs in medical schools.

PHIS 620. Ion Channels in Membranes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Previous course work including basic concepts in electrophysiology, such as those covered in PHIS 501 or PHTX/PHIS/ANAT 509, is highly recommended. Detailed presentation of the fundamental biophysical properties of ionic channels in membranes including the elementary properties of pores, molecular mechanisms of ionic selectivity, mechanisms of drug block, structure-function relationships, and basis for channel gating. Discussion will encompass modern techniques for studying ion channel function. Crosslisted as: PHTX 620.

PHIS 630. Methods in Molecular Biophysics: A Practical Approach. 2 Hours.
Semester course; 2 lecture hours. 2 credits. The course will cover the theoretical and practical aspects of several techniques that are used to study the structure and function of biological macromolecules. In each section the theoretical background and practical application will be covered. The design of the course is to provide a basic familiarity of biophysical techniques used in structural biology and biochemistry laboratories to understand biological phenomena. Graded S/U/F.

PHIS 631. Electrophysiology and Photonic Methods. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course elaborates on the fundamentals of bioelectrical activity (resting and action potentials, electrical propagation and synaptic transmission) guiding the student to the use of equivalent circuits to model the electrical properties of cells design and the use of basic operational amplifiers for electrophysiological studies. The course develops a similar approach to understand the basis for fluorescence and phosphorescence techniques and how they can be applied to biophysical research.

PHIS 650. Critical Thinking in Physiology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Journal club format. Pre- or corequisite: PHIS 501. Enrollment restricted to students with graduate standing or by permission of instructor. This course introduces classical research papers and incorporates problem sets in areas that lend themselves to an analytical approach. Students read and present papers, contributing answers to questions about them.

PHIS 651. MD/PhD Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. Enrollment restricted to students in the MD/PhD program. This course is intended for first-year MD/PhD students as a complement to the ongoing medical curriculum and is designed to expose MD/PhD students to research literature related to their ongoing course work. The objectives are to introduce students to original research papers from the current and classical literature and to provide practice and training in effectively identifying and discussing key hypotheses, methods, results and conclusions, as well as in evaluating the strengths and weaknesses of papers. Graded as Satisfactory/Unsatisfactory.

PHIS 652. MD/PhD Science and Disease. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to students in the MD/PhD program. This course is intended for second-year MD/PhD students as a complement to the ongoing medical curriculum. Clinical faculty or physician-scientists present a patient and then either the physician-scientist or a basic science faculty member discusses the basic science underpinnings of the disease in question. The sessions are coordinated with the MS2B curriculum. Active student participation in the discussion of the case and scientific basis is expected and required. Faculty members are encouraged to present informal sessions designed to encourage student participation and engaged learning. Graded as Satisfactory/Unsatisfactory.

PHIS 689. Physiology Preseminar Highlights. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. Designed to review research to be presented in the department's upcoming weekly seminar. Students present and discuss papers by that week's seminar speaker. Graded as Satisfactory/Unsatisfactory/Fail.

PHIS 690. Physiology Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of research reports and topics of current interest to the departmental seminar or special group seminar.

PHIS 691. Special Topics in Physiology. 1-4 Hours.
Semester course; 1-4 credits. Prerequisite: PHIS 501 (or taken concurrently).

Special Topics in Physiology (Section 1)
 1-4 credits. Lectures, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training.

 Special Topics: Student Seminar (Section 3)
 Semester course; 1 credit. Pre- or corequisite: PHIS 501. Designed to develop skills in preparing and delivering lectures and other oral presentations. Students present talks on topics in which they are particularly interested, and provide mutual constructive criticism.

 Special Topics: Nutrition Research (Section 5)
 Semester course; 3 credits. Weekly discussion of selected topics in nutrition. Topics change yearly. Topics range from biochemical aspects of nutrition to International Nutrition, with selections from various levels of nutritional interest presented each year. Past topics have included nutrition and exercise, diet and cancer, total parenteral nutrition, alcohol nutrition, food safety, drug-nutrient interactions, nutrition and immunological response, cholesterol and nutrition, salty taste mechanisms, vitamin A, vitamin D, and intestinal calcium absorption.

PHIS 692. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded S/U/F.

PHIS 693. Methods in Molecular Biophysics: A Practical Approach. 2 Hours.
Semester course; 1 lecture and 2 laboratory hours. 2 credits. Covers the theoretical and practical aspects of several techniques that are used to study the structure and function of biological macromolecules. In each section, theoretical background and practical applications will be covered. The course will provide a basic familiarity of biophysical techniques used in structural biology and biochemistry laboratories to understand biological phenomena. Graded S/U/F.

PHIS 695. Research in Progress. 0.5 Hours.
Semester course; .5 lecture hour. .5 credit. Restricted to Ph.D. students or, with permission of instructor, master's students. Student presentations and discussion of research results and contemplated research projects base on research rotations, thesis proposals and ongoing thesis research. Graded S/U/F.

PHIS 697. Directed Research in Physiology. 1-15 Hours.
Semester course; 1-15 credits. Research Leading to the M.S. or Ph.D. degree and elective research projects for other students.

Social and Behavioral Health (SBHD)

SBHD 605. Introduction to Social and Behavioral Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course addresses the influence of social and behavioral factors impacting public health, covering both historical perspectives and current issues. Topics covered include the theoretical foundations of social and behavioral health; the sociocultural context of health, health promotion and disease prevention interventions; and special populations and topics.

SBHD 608. Health Communication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Basic course for students in public health with limited experience conducting public health research. Focuses on the history and theories of health communication, social marketing and media advocacy, audience research and segmentation, entertainment education, e-health, provider/patient communication, technology transfer to service providers, media relations and media monitoring, emergency risk communication, and evaluating communication campaigns. Students plan an entire social marketing campaign.

SBHD 609. Research Methods in Social and Behavioral Health I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to graduate students. Recommended preparation: SBHD 605. A didactic and experiential course that provides an introduction to applying social and behavioral qualitative, quantitative and evaluation research methods to public health issues.

SBHD 610. Behavioral Measurement. 3 Hours.
Semester course; 3 lecture hours. 3. credits. Recommended preparation: SBHD 605. Introduces students to theories and applications of measuring constructs in social and behavioral sciences. Examines test theories, processes involved in developing tests and the standards against which tests are compared.

SBHD 611. Health Literacy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to provide doctoral students an overview of health literacy and its relationship to health outcomes and health disparities. Class material will cover the research and theories in contemporary literature in health literacy.

SBHD 619. Research Methods in Social and Behavioral Health II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SBHD 609. Enrollment restricted to graduate students. Advanced application of social and behavioral qualitative, quantitative, intervention and evaluation research methods to public health issues.

SBHD 630. Theoretical Foundations of Social and Behavioral Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course addresses the theoretical foundations of social and behavioral health, discussing both classic and emergent theories. The course begins with an overview of theoretical concepts, constructs and variables; how to construct theoretical statements; and how to evaluate social science theories. The majority of the course is spent describing theories and models at the individual, interpersonal and community level and evaluating their utility in changing health behavior. The course concludes with a discussion of the state of the discipline and future directions in health behavior change theory and research.

SBHD 631. Disseminating, Adopting and Adapting Evidence-based Prevention Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Preventive interventions that have been evaluated and found to be effective should serve as the standard for community-based public health practice. This advanced seminar will examine theories relevant to the diffusion of these evidence-based interventions (EBI), EBI dissemination procedures and policy, and evaluation of EBI adoption, fidelity monitoring and adaptation.

SBHD 632. Health Disparities and Social Justice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This seminar is designed to provide students with an understanding of the concept of health disparities, reasons for disparities and how social factors contribute to disparities in health care and outcomes. The material will cover the research and theories in contemporary medical, epidemiologic and social justice literature.

SBHD 633. Structural Equation Modeling. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Introduces students to principles and applications of structural equation modeling for testing theories in social and behavioral sciences. Examines latent variables with continuous and discrete distributions, multimethod measurement modeling under the latent variable framework, latent variable modeling of longitudinal measurement designs and testing meditation and moderation using structural equation modeling.

SBHD 634. Patient-Provider Interaction. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral student or M.P.H. student in social and behavioral health or permission of instructor. Provides students with an advanced introduction to the current theoretical and practical approaches to researching patient-provider interaction. Through exploration of current theory and case studies in practical research, the course develops a comprehensive approach to conducting high-quality, theory-driven research exploring both physician- and patient-focused observational and interventional research. Students are provided with instruction on qualitative, quantitative and mixed-method approaches to such research.

SBHD 635. Anthropology and Public Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral student or M.P.H. student or permission of instructor. Provides students with an advanced introduction to anthropology as a means for exploring public health. Through ethnographic case studies (articles, books and films), the course examines cultural dimensions of illness experience and diverse models of healing and treatment, paying particular attention to political, economic, spiritual and other cultural factors that influence health inequalities, treatment and health behaviors. Approximately 80 percent of the course material focuses on international health. The course is a readings seminar rather than a methodological course; however, students will be asked to think critically about the ways that anthropological methods can contribute to public health practice.

SBHD 636. Community-based Participatory Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral student in social and behavioral health or permission of instructor. This seminar provides students with an understanding of the theories, principles and strategies of conducting CBPR. This class will meet once a week for approximately three hours. Although some lectures will be presented, the main format for the class will reflect the participatory as well as critical reflectiveness required to conduct CBPR. Co-learning will be emphasized against a backdrop of health research. The second major component of this class will be an interactive and hands-on field experience where students will experience the context and learn the methods to use when conducting participatory research for health. Students will work closely with a community partner and will use participatory research methods to address a community partner need.

SBHD 637. Program Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral student in social and behavioral health or permission of instructor. This course examines the methods frequently used to determine whether -- and how -- health-related programs are achieving their objectives. Several types of evaluations will be covered, with a focus on process and outcome evaluations. Skills and knowledge relevant to evaluation strategies will be addressed, including the fundamentals of framing evaluation questions, selecting a study design and result dissemination strategies. Students will learn how to judge the quality of evaluation designs, distinguish appropriate from inappropriate evaluations and be given the opportunity to apply the principles and techniques of evaluation science to the creation of a detailed evaluation plan. Materials will be presented in several ways, including lectures, guest lectures, in-class exercises, student presentations, classroom discussions and written assignments.

SBHD 638. Applications in Qualitative Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral student in social and behavioral health or permission of instructor. This course will cover theories, principles and applications to enable high quality research using qualitative research methods. This course will educate students on theories of qualitative research, different methodologies used to gather qualitative data and practical applications of these theories and methods to guide research development in this area. Students will be given the opportunity to analyze published research, conduct qualitative analyses using previously collected data, code and quantify qualitative data, and develop their own plans for a research project.

SBHD 639. Intervention Development and Implementation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: doctoral-level course work in research methods and health behavior theory; permission of instructor. The goal of this course is to provide students with knowledge and applied skills in the development and implementation of behavioral interventions to promote health and prevent disease. Students will receive training in evidence-based behavioral medicine approaches and best practice methods for effectively promoting behavior change in individuals and families. The course takes a sequential and hands-on approach in which students will learn about each step of the intervention development and implementation process and will gain experience applying what they learn to the development of their own intervention. Relevant methodological issues will be covered, with an emphasis on design and methods for randomized controlled trials testing individual-level behavioral interventions across settings. Students will learn to think critically about how to balance theory, empirically supported strategies and pragmatic considerations in the development and execution of intervention trials, with an emphasis on achieving maximum impact in their work. Course objectives will be achieved through lectures, experiential in-class activities, informal Q&A with PIs about their experiences developing and implementing intervention trials, student presentations, classroom discussion and written assignments that map on to key sections of a grant proposal.

SBHD 640. Seminar in Mixed Methods Research. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisites: SBHD 638; and HCPR 732 or SBHD 609. This course provides an overview of best practices in mixed methods research in the social and behavioral sciences and serves as a methods capstone course for SBS doctoral students who have completed the foundational research methods and applications in qualitative research methods courses.

SBHD 690. Departmental Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Students will attend seminars presented by faculty and invited guests on topics and trends within health policy and health services research. Students and faculty will meet weekly to discuss the theoretical concepts and papers presented and other related topics. Graded as S/U/F. Crosslisted as: HCPR 699.

SBHD 691. Special Topics. 0.5-4 Hours.
Semester course; 0.5-4 lecture hours. 0.5-4 credits. Lectures, tutorial, workshops and/or library assignments in selected areas of advanced study which are not available in other courses or as part of the research training. Graded as S/U/F.

SBHD 692. Special Topics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This letter-graded course will include lectures and other activities in areas of advanced study which are not available in other courses or as part of research training.

SBHD 693. SBHD Internship. 1-3 Hours.
Semester course. variable hours (60 hours per credit). 1-3 credits. Students will spend 60 to 180 hours in a planned, supervised experience with a community agency. Such agencies might include a local free clinic or other nonprofit organization, such as the American Cancer Society, or a local, state or federal public health agency. Graded as S/U/F.

SBHD 694. MPH Project. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Each student will complete a research project that demonstrates the application of the knowledge acquired in the M.P.H. program. The student will answer one or more relevant research questions. The final product is a scholarly written report of publishable quality. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with the faculty adviser. Graded as S/U/F.

SBHD 695. Independent Study. 1-3 Hours.
Semester course; 1-3 independent study hours. 1-3 credits. Provides the opportunity for students to explore a special topic of interest under the direction of a faculty member. A proposal for a course of study must be submitted to and approved by the program director of the social and behavioral science doctorate; credits will be assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member and the program director. Graded as S/U/F.

SBHD 697. Directed Research in Social and Behavioral Health. 1-15 Hours.
Semester course; variable hours. 1-15 credits. Requires students to conduct and prepare a written dissertation under the guidance of a faculty committee. The dissertation is written in traditional academic style and must be orally defended. Students must be continually enrolled in this course until successfully completed and approved. A minimum of 9 credits of this course must be taken to complete the degree. Graded as Pass/Fail.

School of Nursing

Nursing (NURS)

NURS 501. Advanced Professionalization I. 1 Hour.
Semester course delivered online; 1 lecture hour. 1 credit. Prerequisite: admission to the graduate program in nursing. Focuses on socialization to the roles and responsibilities related to advanced nursing preparation. Introduces the history, competencies and roles of advanced practice nursing with an emphasis on role acquisition. Addresses trends and issues which shape advanced practice nursing.

NURS 502. Advanced Nursing Practice: Pharmacotherapeutics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the graduate program in nursing. Develops the requisite knowledge of pharmacotherapeutics necessary for the safe pharmacological management of common patient problems by the advanced practice nurse.

NURS 503. Ethics, Advanced Nursing Practice and the Health Care Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 501. Grounded in the disciplinary perspective and heritage of nursing, emphasizes analysis of ethical concepts foundational to advanced nursing practice while considering diverse perspectives of the patient, family, health care team and organizational system. Focuses on applying ethical decision-making frameworks to analyze ethical dilemmas and negotiating individual and team-based values. Addresses development of effective communication and leadership strategies for promoting ethical health care delivery and managing ethical conflicts.

NURS 504. Advanced Pathophysiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to the nursing program. Focuses on the biological and pathophysiological foundations of health problems across the life span. Uses biologic changes underlying selected health risks and health problems as a framework for critically appraising health assessment data and for understanding advanced nursing therapeutic strategies.

NURS 507. Health Promotion and Disease Prevention Across the Lifespan. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Pre- or corequisite: NURS 504. Focuses on advanced nursing assessment and the design and delivery of evidence-based, culturally relevant health promotion and disease prevention strategies for individuals across the lifespan. Applies theories, concepts and research findings related to health promotion, health protection and disease prevention as a basis for clinical decision-making with child, adolescent and adult patients and their families within a variety of care settings.

NURS 508. Policy, Processes and Systems for Advanced Nursing Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the nursing program. Explores various influences on the structure and financing of health care, advanced nursing practice and health outcomes from a macro and micro perspective of the current health care system. Addresses the policy-making process at various levels of government and within institutions, policies affecting current and future nursing care delivery systems and nursing's role in policy advocacy to improve the quality of health care delivery. Using policy, processes and systems-level strategies, including quality improvement and high reliability organizational theory, students will be able to articulate the methods, performance measures, culture of safety principles and quality standards necessary for effective leadership as a change agent in the current health care system.

NURS 511. Health Assessment for Advanced Nursing Practice. 3 Hours.
Semester course; 2 lecture and 45 clinical/laboratory hours. 3 credits (2 credits lecture and 1 credit clinical/laboratory). Prerequisite: admission to the nursing program. Provides the framework for holistic, culturally relevant assessment of individuals. Focuses on advancing students' knowledge and assessment in health history, risk appraisal, health promotion, psychosocial, developmental and functional assessment and physical examination techniques. Emphasizes the application of diagnostic reasoning skills in assessing deviations from normal in selected content in specialty areas. Includes supervised experiences with advanced clinical assessment skills.

NURS 512. Evidence-Based Advanced Nursing Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the graduate program in nursing or Honors College. Grounded in the disciplinary perspective of nursing, focuses on appraisal of research evidence to guide advanced nursing practice. Addresses the use of clinical and epidemiological data to identify clinical problems, health risks and organizational issues that impact health outcomes of individuals, families and communities. Reviews application of criteria for evaluating research studies using foundational knowledge of major research designs and basic statistics. Emphasizes appraisal and synthesis of scientific literature to design evidence-based practice strategies and outcome measures in the context of a selected clinical problem, population health risk or organizational issue. Reviews the process of research translation and ethical conduct of research.

NURS 591. Special Topics. 1-3 Hours.
Semester course; 1-3 credits. Prerequisite: admission to the graduate program in nursing. Explores specific topics in nursing theory and practice.

NURS 592. Directed Study in Nursing. 1-3 Hours.
Semester course; variable hours. 1-3 credits. Prerequisite: admission to the graduate program in nursing. Independent study in a specific area of nursing developed under the supervision of a member of the graduate faculty.

NURS 594. Directed Study: Nursing Clinical Practicum. 1-6 Hours.
Semester course; 45-270 clinical/lab hours. 1-6 credits (1-6 clinical/lab credits). Prerequisite: permission of instructor. Independent study in specific practicum area of nursing developed under the supervision of a faculty member. Graded as pass/fail.

NURS 601. Advanced Professionalization II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: NURS 501. Designed to prepare students to assume an advanced practice nursing role after graduation. Focuses on role development in advanced practice nursing, marketing oneself as an advanced practice nurse, and regulatory and economic policies that affect advanced practice nursing in today's health care system. Presents strategies to evaluate outcomes attributable to APN practice.

NURS 605. Statistical Methods for Quality Improvement. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits (3 credits lecture). Enrollment restricted to students admitted to a graduate program. This course focuses on common analytic approaches in practice change projects, including correlation, chi-square analysis, independent and paired t tests, analysis of variance, and logistic and multiple regression. Selection of the most relevant analytic strategy to determine clinical significance of a quality improvement initiative will be emphasized. The application of statistical process control methods to health care quality improvement projects will be emphasized. The student will apply principles of statistical analysis to a dataset using statistical software to identify characteristics of participants and outcomes.

NURS 606. Evaluating Evidence to Improve Health Outcomes. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 credits lecture). Prerequisite: NURS 605. Provides essential skills for using research evidence to support and promote practice change. Collaboration between nursing and other disciplines in problem identification will be explored. Ethical dimensions of quality improvement research and research evidence will be reviewed. Students will formulate a clinical question, search for supporting evidence, apply appraisal principles to evaluate the evidence and derive practice-specific recommendations for implementation.

NURS 607. Epidemiology and Population Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 credits lecture). Prerequisite: NURS 605. Integrates principles of epidemiology, evidence-based clinical prevention, health screening, behavioral modification, disease modification and disease management of populations and quality metrics. Students will assess population health models and frameworks to address a multilevel perspective of the health status of vulnerable populations and sources of health inequalities. Cultural perspectives will be emphasized at a regional, national and global level.

NURS 608. Quality Improvement in Practice. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits (3 credits lecture). Enrollment restricted to students admitted to a graduate program. This course prepares the student for proficiency in the development of quality improvement initiatives for sustainable practice change. The student will assess evidence as it relates to cost, quality and health outcomes (individual and aggregate) within the context of current regional and national health care trends and emerging issues. Emphasis will be on the methods and tools utilized in performance improvement and patient safety. The student will develop a quality or safety initiative using a systems approach.

NURS 609. Health Care Delivery and Reimbursement Systems for Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course summarizes contemporary issues in health care delivery, evolving models of health care delivery systems and reimbursement. The focus is on current policies and systemic factors that affect the delivery of health care to the U.S. population and their potential impact on future health care delivery. The course presents factors affecting the evolution of the U.S. health care system and health care provider roles with a focus on the nurse and advanced practice. Issues are presented in context of patient-centered care and population-level aims for quality outcomes.

NURS 610. Health Information and Emerging Health Care Technologies. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 credits lecture). Enrollment restricted to students admitted to a graduate program. Health informatics will be explored as an integral component of health care delivery. Focuses on building understanding of effective use and evaluation of health information technologies. Particular emphasis will be on informatics' role in health care decision-making, access to care, patient safety and quality of care. Also emphasizes the use of health informatics as a component of patient care and for the improvement of quality and safety outcomes over time, leading to sustainable change. Additional focus on current and emerging technologies.

NURS 611. Primary Care Advanced Practice Clinical Procedures. 1 Hour.
Semester course; 7.5 lecture and 22.5 laboratory (contact) hours. 1 credit. Prerequisites: NURS 504 and 511. Provides the foundation for acquiring a beginning level of competency in a variety of common primary care advanced clinical practice skills and procedures. Emphasizes correct technique and includes supervised experiences.

NURS 612. Acute Care Advanced Practice Clinical Procedures. 1 Hour.
Semester course; 7.5 lectureand 22.5 laboratory (contact) hours. 1 credit. Prerequisites: NURS 504 and 511. Provides the foundation for acquiring a beginning level of competency in a variety of common acute care advanced clinical practice skills and procedures. Emphasizes correct technique and includes supervised experiences.

NURS 613. Organizational Behavior and Leadership for Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: NURS 668. This course introduces students to organizational behavior as it relates to leadership theory based on classic and contemporary readings in organizational behavior. Students will engage in self-evaluative processes to assess and enhance their leadership capabilities in relation to elements of sound leadership principles. The course will examine topics in organizational behavior that relate to the nurse leader role in health care delivery. Management principles are outlined, discussed and put in context to give a realistic focus to issues in leadership and organizational behavior. The course uses case method, simulation, discussion, self-assessment instruments, written exercises and audiovisual aids to illuminate leadership and managerial practices in relation to organizational behavior.

NURS 614. Organizational Systems and Leadership for Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to the graduate program in nursing. This course introduces a systems approach to health care organizational operations leadership and management. Students will gain an understanding of how nurse leaders working with the health care team organize and use structures and analytical approaches to assess and report on the efficiency and effectiveness of work processes that affect patient care, satisfaction and health outcomes. Students will gain skills in operations management by analyzing work processes, patient flow, project management, and the supply chain and customer service.

NURS 615. Diagnosis and Management in Adult-Gerontology Primary Care I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: NURS 501, NURS 504, NURS 507, NURS 511. Provides content on the primary care management of health and illness changes throughout the adult lifespan. This course focuses on increasing the nurse practitioner student's knowledge and clinical decision-making skills in order to provide health screening, identify health promotion needs, and accurately diagnose and manage common health conditions across the adult lifespan. Emphasis is placed on developmental, prevention, pathophysiological, pharmacological and critical-thinking skills in the management of common complex and multisystem disorders.

NURS 616. Diagnosis and Management in Adult-Gerontology Primary Care II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 615. This course is a continuation of NURS 615. The course includes prevention, pathophysiological, pharmacological and critical-thinking skills in maximizing health with common and complex health problems. Emphasis is placed on increasing the nurse practitioner student's knowledge and clinical decision-making skills in order to provide health screening, identify health promotion needs, accurately diagnose and provide women's-and adult-specific care and psychobehavioral care across the adult lifespan, particularly in the context of common complex and multisystem disorders.

NURS 617. Advanced Gerontology Primary Care Across the Care Continuum. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: NURS 616. Students will further examine and integrate physiological, psychological and sociocultural processes associated with normal aging. Relevant theories, concepts and research findings from the behavioral, social and biological sciences are analyzed as a basis for advanced nursing practice with older adults and their families. Emphasis is placed on enhancing the individual's health within the context of their functional capabilities, social support networks and environment. Important geriatric care models for effective practice with older adults across the care continuum -- coordinated care, transitions of care and complex care management -- are reviewed.

NURS 618. Diagnosis and Management in Adult-Gerontology Acute Care I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Pre- or corequisites: NURS 501, NURS 504, NURS 507, NURS 511. Provides content on the management of adult and geriatric patients and populations who are physiologically unstable, technologically dependent and/or highly vulnerable to complications. The focus of this course is on increasing students' acute care knowledge and decision-making skills in order to accurately assess, diagnose and manage complex acute, critical, and chronically ill or injured adult and geriatric patients.

NURS 619. Diagnosis and Management in Adult-Gerontology Acute Care II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 618. This course is a continuation of NURS 618. The course provides content on the management of adult and geriatric patients who are physiologically unstable, technologically dependent and/or highly vulnerable to complications. The focus of this course is on increasing students' acute care management knowledge and decision-making skills in order to stabilize the patient's condition, prevent complications, restore maximum health and provide palliative care.

NURS 620. Gero-pharmacology. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: NURS 502. This course refines knowledge of pharmacotherapeutics needed by the advanced practice nurse for the safe pharmacological management of common patient problems in older adults. Emphasis is placed on the interprofessional team, including families and caregivers, as an essential component of care for older adults.

NURS 621. Leadership and Organizational Systems. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 credits lecture). Prerequisite: NURS 608. Examines system leadership and change within the context of organizational culture. Models and strategies related to leadership, effective organizational processes, organizational change, strategic planning and intraprofessional teamwork will be evaluated. Emphasizes development of skills in system assessment and system intervention design.

NURS 627. Foundational Perspectives of Family-centered Care. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: admission to the graduate program in nursing. This course is foundational to the family nurse practitioner curriculum and provides the theoretical foundation and context for the FNP's role in the care of families. The course will emphasize analysis of theories and research concerning families. The effects of psychosocial, cultural, socioeconomic and spiritual variables on families at risk will be discussed. The effects of transitions and crises on the health/illness status of patients in the context of family will be explored. Culturally appropriate communication skills to facilitate family decision-making and foster positive behavioral change in the patient and caregiver will be analyzed. Students will examine their personal beliefs and family life experiences to inform their developing advanced practice role.

NURS 629. Diagnosis and Management in Family Primary Care I. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Enrollment restricted to students admitted to a graduate program in nursing. This course is designed to introduce the student to the role of the nurse practitioner as a provider of primary care across the lifespan. Concepts of advanced health assessment, pharmacology and pathophysiology are synthesized with a focus on diagnostic decision-making and interdisciplinary management of common acute and chronic health problems. Emphasis is placed on facilitating optimal health and function of patients from newborn through senescence. Strategies to enhance, maintain and restore health are emphasized, while promoting health-seeking behaviors and the impact on family-centered care.

NURS 630. Diagnosis And Management In Family Primary Care II. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: NURS 629. This course is a continuation of NURS 629. Concepts of health promotion and disease prevention, advanced health assessment, pharmacology, and pathophysiology are incorporated into the diagnosis and interdisciplinary management of common acute and chronic health problems. Emphasis is placed on the formation and evaluation of comprehensive evidence-based care with regard to the care of common complex and multisystem disorders. Strategies to enhance, maintain and restore health are emphasized. Health-seeking behaviors and the impact on family are stressed.

NURS 631. Primary Care of Select Populations. 2 Hours.
Semester course; 1 lecture and 45 clinical/lab hours. 2 credits (1 credit lecture and 1 credit clinical/lab). Prerequisites: NURS 629 and NURS 630. This course addresses the diagnosis and management of select primary care topics in women's health, pediatrics, gerontology and psychiatric-mental health. Laboratory experiences including simulation, standardized patients and objective structured clinical examinations will accompany didactic content delivery. Graded P/F.

NURS 635. Advanced Practice Psychiatric Mental Health Nursing Practicum I. 6 Hours.
Semester course; 270 clinical/lab hours. 6 credits (6 credits clinical/lab). Prerequisites: NURS 502, NURS 503, NURS 511 and NURS 657; corequisite: NURS 636. Focuses on the diagnosis and management of mental health problems and psychiatric disorders for individuals, families and groups across the lifespan through faculty supervised clinical experiences with a preceptor. Demonstrates ability to perform a comprehensive psychiatric evaluation while incorporating therapeutic communication skills. Provides opportunities to apply knowledge of standardized taxonomy systems and evidence-based screening guidelines to formulate a differential diagnosis. Requires students to develop plans of care incorporating evidence-based practice guidelines. Performance of clinical skills at a basic level is expected. Graded Pass/Fail.

NURS 636. Advanced Practice Psychiatric Mental Health Nursing Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 lecture credits). Corequisite: NURS 635. Prepares for and builds on practicum experience. Focuses on the management of both acute and chronic psychiatric disorders for individuals, families and groups across the lifespan. Examines the unique characteristics of selected populations diagnosed with mental health problems or psychiatric disorders and ways to address complex management needs through a case study approach. Provides opportunities for students to plan and discuss treatment plans while integrating health promotion and education strategies. Students are expected to apply knowledge of both psychotherapeutic and psychopharmacologic interventions. Focuses on synthesis of evidence to analyze clinical decision-making and formulate a patient-centered plan of care across the treatment trajectory.

NURS 637. Advanced Practice Psychiatric Mental Health Nursing Practicum II. 6 Hours.
Semester course; 270 clinical/lab hours. 6 credits (6 credits clinical/lab). Prerequisite: NURS 635. Builds on previous practicum experience. Focuses on the advanced management of mental health problems and psychiatric disorders for individuals, families and groups across the lifespan through faculty-supervised clinical experiences with a preceptor. Students will implement and evaluate the management of both common and complex mental health problems and psychiatric disorders. Provides opportunities for the synthesis, application and evaluation of knowledge needed to provide evidence-based psychiatric care. Focuses on strategies to lead the interprofessional health care team in quality improvement methods. Promotes the provision of high-quality, collaborative and ethical care. Performance of clinical skills at the advanced level is required. Graded as Pass/Fail.

NURS 638. Health Policy Leadership and Advocacy. 3 Hours.
Semester course; 3 lecture hours. 3 credits (3 credits lecture). Prerequisite: NURS 606. Emphasizes critical analysis of the political, organizational, economic, ethical, and quality and safety dimensions of health policy issues. Contextual factors such as social justice, health disparities, vulnerable populations, access to care, health care financing and the globalization of health care will be explored. Leadership skills in health policy advocacy will be refined throughout the course.

NURS 639. Health Informatics for Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. The course gives students a broad overview of health informatics in the context of the health care organization; discusses principles of informatics and information flows in nursing and health care using systems analysis techniques; and emphasizes understanding of how nurse leaders implement, manage and evaluate health care information and informatics projects. Information and communication technology system integration, data security, as well as ethical and regulatory issues, will be reviewed. Current topics and issues related to the use, retrieval, evaluation and dissemination of health care information will be discussed, as well as the role of informatics in decision-making.

NURS 643. Family Primary Care Practicum I. 6 Hours.
Semester course; 270 clinical/lab hours. 6 credits (6 credits clinical/lab). Prerequisites: NURS 629 and NURS 630; corequisite: NURS 644. This precepted practicum course is designed to provide opportunities for students to develop beginning competencies as a family nurse practitioner. Critical-thinking and diagnostic-reasoning skills will be developed. Skills of advanced health assessment and knowledge of the management of common health problems will be applied in the clinical setting. Students will order, conduct and interpret appropriate screening and diagnostic tests, generate differential diagnoses and, in conjunction with the preceptor, determine diagnosis and management plan. Students will demonstrate effective case presentations to preceptor and document appropriately. A minimum of 45 practicum hours (135 hours total) in women's health, geriatrics and pediatrics will be completed between the two practicum courses. Graded as pass/fail.

NURS 644. Family Primary Care Seminar. 1 Hour.
Semester course; 1 seminar hour (15 lecture hours). 1 credit. Corequisite: NURS 643. Seminars will emphasize skill development in the teaching-coaching function. A case-study approach will provide the basis for in-depth assessment and discussion of health and illness problems. Case analysis and discussion will enhance the student's ability to manage the health and illness status of patients and families over time. Graded as pass/fail.

NURS 645. Family Primary Care Practicum II. 6 Hours.
Semester course; 270 clinical/lab hours. 6 credits (6 credits clinical/lab). Prerequisites: NURS 643, NURS 644; corequisite: NURS 646. This practicum course serves as the culminating experience in the family nurse practitioner concentration focused on skill refinement with increasing responsibility in the delivery of primary care to families. Students will work with clinical preceptors to assimilate practice management skills pertaining to economics, reimbursement for services and time management. Primary care skills including prioritization, management and coordination of both routine and complex episodic and chronic illness problems and technology utilization are refined. Interdisciplinary collaborative practice skills are emphasized. Configuration of practicum hours will be based on results of individualized assessment and evaluation performed in NURS 644. A minimum of 45 practicum hours (135 hours total) in women's health, geriatrics and pediatrics will be completed between the two practicum courses. Graded P/F.

NURS 646. Family Primary Care Final Synthesis Seminar. 1 Hour.
Semester course; 1 seminar hour (15 lecture hours). 1 credit. Prerequisites: NURS 643, NURS 644; corequisite: NURS 645. This seminar is designed to facilitate the student's ability to integrate theory, research and clinical practice. An in-depth analysis of the evaluative, consultative, systems leadership and advocacy functions of the nurse practitioner role within a professional, ethical and legal framework will be performed. Students will complete an evidence-based clinical project that demonstrates synthesis of knowledge, as well as written, oral and critical-thinking skills. Graded P/F.

NURS 651. Decision Analysis for Quality Outcomes Across Populations. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course focuses on managerial decision-making and planning. The main focus is to introduce widely used methods that aid in decision-making and planning, including intuitive approaches, quantitative methods (samples and probabilities, decision trees, tradeoff analysis) and applied approaches to evaluate problems as well as progress toward solutions (assessing risk, root cause analysis, gap analysis and benchmarking). Each method uses real-world illustrations. Students will have the opportunity to use applied approaches to pose solutions to problems faced by nurse managers and leaders.

NURS 652. Health Care Managerial Finance I: For Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides introductory business financial management training. The course describes opportunities for improving a health system's fiscal efficiencies and delivery by providing practical approaches to budgeting, financial analysis and the management of financial resources. The course provides instruction on the development and analysis of financial spreadsheets. Financial accounting principles are reviewed. Conceptual and real-world issues will be addressed using tools to analyze nursing and health care organizational performance, costs, budgets and variance.

NURS 653. Health Care Managerial Finance II: Economic Evaluation and Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 651 and NURS 652. This course presents an overview of the macro and micro economy as an influencing factor on health care delivery presented in the context of ethical considerations and techniques that enhance efficiency. The course covers various cost-effectiveness analysis tools that enhance the ability of decision-makers to assess efficiencies and effectiveness. The main goal for students is to understand the parameters for using these techniques and how they are applied in nursing as well as in interdisciplinary approaches in health care settings.

NURS 656. Diagnosis and Management of Psychiatric Disorders Across the Lifespan. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: NURS 657. Students will develop advanced practice psychiatric-mental health nursing knowledge related to the psychodiagnostic, psychopharmacologic and psychotherapeutic evaluation/treatment of psychiatric disorders across the lifespan. This course focuses on the neurobiological basis of psychiatric disorders and associated evidence-based treatments. Addresses knowledge needed for comprehensive and collaborative management of culturally diverse clients with psychiatric disorders in both acute and primary health care settings.

NURS 657. Advanced Practice Psychiatric Mental Health Nursing: Theory and Practice Across the Lifespan. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisite: NURS 504. Focuses on advanced psychiatric mental health nursing practice by integrating theoretical, clinical and research knowledge related to psychotherapeutic management of acute and chronic mental health problems and psychiatric disorders. Examines knowledge of theories and psychotherapeutic techniques for individuals, families and groups across the lifespan. Analyzes interprofessional practice as applicable to the psychiatric mental health setting.

NURS 662. Diagnosis and Management in Adult-Gerontology Critical Care. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Prerequisites: NURS 618 and 619. Provides content on selected common health and illness changes encountered in adult-geriatric critical care settings. The focus of this course is on increasing students' knowledge about common problems seen in the adult critical care environment.

NURS 664. DNP Residency: Mentored Practicum. 1-6 Hours.
Semester course; 1-6 clinical/lab hours (45-270 clinical hours). 1-6 credits. May be repeated for a maximum total of 18 credits. Prerequisites: NURS 605 and NURS 608; 500 clinical practice hours. Mentored study that facilitates student demonstration of DNP competencies through documented learning experiences and implementation of the DNP project. Practice setting and focus of residency hours are individualized to student's specific area of interest. Residency activities will be mutually developed by the student and faculty adviser, culminating in a professional portfolio that demonstrates achievement of all course objectives by the completion of the 12 required residency credits. Graded as pass/fail.

NURS 665. DNP Project I: Proposal Development. 3 Hours.
Semester course; 3 lecture/seminar hours. 3 credits (3 lecture/seminar credits). Prerequisites: NURS 605, NURS 606, NURS 607 and NURS 608. Provides the student with the support and direction needed to develop a comprehensive DNP project proposal. The DNP project is designed to improve quality and/or safety patient outcomes. Students use evidence-based practice to design the DNP project that is focused in a specialized clinical area. Students work in collaboration with their faculty adviser and DNP project team. Graded as pass/fail.

NURS 666. Strategic and Change Management for Quality Outcomes for Nurse Leaders. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: NURS 613. This course introduces strategic management principles, models and tools useful for implementing sustainable organizational change. Students will be able to align organizational and nursing-specific mission, vision and goals setting a strategic direction. Students gain applied practice in select strategic and change-management processes in real-world nursing contexts and discuss how these processes optimize or hinder quality patient care outcomes. Finally the course explores factors that facilitate sustaining a strategic direction and how sustainability builds markers of superior performance and quality.

NURS 667. DNP Project II: Project Implementation and Evaluation. 3 Hours.
Semester course: 3 lecture/seminar hours. 3 credits (3 lecture/seminar credits). May be repeated. Program culminates in the successful completion of a scholarly project designed by the student in collaboration with the faculty adviser and DNP project team. The DNP student will analyze and summarize findings and defend the DNP project. The final DNP product (criteria outlined in the DNP handbook) is a scholarly manuscript that provides evidence of the student's critical thinking and ability to translate research through problem identification, proposal development, implementation, and evaluation. Graded as pass/fail.

NURS 668. Human Resource and Customer Relationship Management for Nurse Leaders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 508 and NURS 609. Corequisite: NURS 613. This course examines the role of human resource management in health care and nursing organizations in meeting the challenge of continually improving patient care services. Students will gain an understanding about strategies useful to empower, motivate, hire and retain nursing talent. The course discusses topics in HR management appropriate for nurse leaders and frontline managers such as nursing workforce training, competencies, performance appraisals, recruitment and retention, and progressive disciplinary approaches. HR concepts about workforce capabilities and employee satisfaction will be discussed in relation to their association with patient satisfaction and health care delivery outcomes.

NURS 669. Adult-Gerontology Acute Care Practicum II. 4 Hours.
Semester course; 180 clinical hours. 4 credits (4 credits clinical practicum). Prerequisite: NURS 678. Focuses on providing acute care management of adults-older adults with complex acute, critical and chronic health conditions. Particular emphasis will be placed on integrating health promotion, protection and disease-prevention interventions; safety principles; and risk-reduction strategies through faculty-supervised clinical experiences with a preceptor. Building on previous practicum experience, students guide and evaluate resuscitation, stabilization and rehabilitation interventions while integrating preventive strategies to reduce complications. Provides opportunities to develop and carry out the plan of care and incorporate evidence-based practice guidelines to improve patient outcomes. Performance at the intermediate level is expected. Graded pass/fail.

NURS 675. Adult-Gerontology Primary Care Practicum II. 4 Hours.
Semester course; 180 clinical hours. 4 credits (4 credits clinical practicum). Prerequisite: NURS 676. Focuses on primary care management of adults-older adults throughout the wellness-illness spectrum with particular attention on integrating health maintenance and risk-reduction interventions for patients with comorbidities through faculty-supervised clinical experiences with a preceptor. Building on previous practicum experience, students implement health screening, health promotion, health protection and risk-reduction strategies for adolescent-older adults within the context of their current health issues and comorbidities. Provides opportunities to develop and carry out the plan of care incorporating evidence-based practice guidelines to improve patient outcomes. Performance at an intermediate level is expected. Graded pass/fail.

NURS 676. Adult-Gerontology Primary Care Practicum I. 1-3 Hours.
Semester course; 45-135 clinical hours. 1-3 credits (1-3 credits clinical practicum). Prerequisite: NURS 511. Focuses on providing primary care management of adolescent-older adults across the wellness-illness continuum through faculty-supervised clinical experiences with a preceptor. Provides opportunities to focus on the differing and unique developmental, life stage needs that impact a patient's care across the adult age spectrum and application of evidence-based strategies in directing health promotion, health protection, disease prevention and primary care management of injuries and disease. Students must demonstrate ability to synthesize theoretical, scientific and contemporary clinical knowledge for the assessment and management of both health and illness states and apply knowledge within the framework of different practice models and populations. Performance at a basic level is expected. Graded as pass/fail.

NURS 677. Adult-Gerontology Primary Care Practicum III. 5 Hours.
Semester course; 255 clinical hours. 5 credits (5 credits clinical practicum). Prerequisite: NURS 675. Focuses on advanced primary care management of adolescent-older adults with complex health issues and comorbidities through faculty-supervised clinical experiences with a preceptor. Building on previous practicum experience, students implement and evaluate health screening, health promotion, health protection, disease prevention, risk-reduction strategies and systems-based coordination in the management of adults-older adults with complex health conditions. Provides opportunities for leadership within the interprofessional health care team to direct quality improvement methods, implementation of evidence-based practice guidelines to address a clinical problem and evaluation of patient and systems-based outcomes. As the final practica course, performance at the advanced level is expected. Graded as pass/fail.

NURS 678. Adult-Gerontology Acute Care Practicum I. 1-3 Hours.
Semester course; 45-135 clinical hours. 1-3 credits (1-3 credits clinical practicum). Prerequisite: NURS 511. Focuses on providing acute care management of adolescent-older adults who are physiologically unstable, technologically dependent and highly vulnerable to complications through faculty-supervised clinical experiences with a preceptor. Provides opportunities to focus on the provision of a spectrum of care ranging from disease prevention to acute and critical care management. Students must synthesize theoretical, scientific and contemporary clinical knowledge for the assessment and management of both health and illness states and apply knowledge within the framework of different practice models and differing populations. Performance at a basic level is expected. Graded as pass/fail.

NURS 679. Adult-Gerontology Acute Care Practicum III. 5 Hours.
Semester course; 225 clinical hours. 5 credits (5 credits clinical practicum). Prerequisite: NURS 669. Focuses on advanced acute, critical and chronic management of adolescent-older adults who are physiologically unstable, technologically dependent and highly vulnerable to complications through faculty-supervised clinical experiences with a preceptor. Building on previous practicum experience, students integrate health screening, promotion, protection and disease-prevention interventions; safety principles; risk-reduction strategies; and systems-based coordination in the management of adults-older adults with complex acute, critical and chronic injuries and illnesses throughout the trajectory of resuscitation, stabilization and rehabilitation. Provides opportunities for leadership within the interprofessional health care team to direct quality improvement methods, implementation of evidence-based practice guidelines to address a clinical problem and evaluation of patient and systems-based outcomes. As the final practica course, performance at the advanced level is expected. Graded as pass/fail.

NURS 691. Nursing Research Practicum. 3 Hours.
Semester course; 3 laboratory hours. 3 credits. Prerequisite: NURS 512. Participates in ongoing research. Implements research with faculty direction and supervision.

NURS 695. Managing for Performance and Health Care Outcomes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 508 and NURS 512. This course synthesizes organizational systems approaches to design, identify, analyze and benchmark quality and safety initiatives in health care settings across the continuum. Students will gain an overview of how evidence drives decisions about and implementation of processes in organization performance improvement. Students will also apply principles in quality and safety project design to address a specific issue affecting patient care outcomes.

NURS 696. Practicum I: Comparative Health Care Delivery Systems for Nurse Leaders. 2 Hours.
Semester course; 90 clinical/lab hours. 2 credits. Prerequisites: NURS 609, NURS 613 and NURS 614. This practicum experience is designed to integrate theory with the reality of various organizational contexts impacting health care delivery systems, nursing systems and leadership. The overall purpose is to provide students with opportunities to compare how different systems influence nursing practice and nursing leadership. The practicum is designed with three separate units to give students opportunities to compare different health care settings, which may include local, regional, national and international contexts. Graded Pass/Fail.

NURS 697. Practicum II: Comparative Interdisciplinary Health Care Leadership Roles. 1 Hour.
Semester course; 45 clinical/lab hours. 1 credit. Prerequisite: NURS 696. In this course the student applies principles of professional inquiry and discovery to engage in dialogue with nurse leaders as well as interdisciplinary professional managers and leaders in ambulatory care settings. Students will also gain applied experience in ancillary department settings central to health care delivery that are important in maintaining organizational system efficiency and effectiveness but generally are outside the domain of nursing-directed patient care. Ancillary department experiences may take place in ambulatory or inpatient settings. Graded Pass/Fail.

NURS 698. Practicum III: Applied Integrative Health Care Delivery Leadership. 3 Hours.
Semester course; 135 clinical/lab hours. 3 credits. Prerequisite: NURS 697. In this course the student applies a broad range of managerial knowledge, skills and multidisciplinary theoretical constructs, e.g., nursing, business, organizational systems, organizational behavior, strategy and change management. Students will complete a formal organizational-level gap analysis and communicate formally and informally to others in the organization about a strategic and change-management plan to address the nursing issue(s) examined in the gap analysis. Students will gain guided experience from a nurse leader about management roles, the organizational perspective on strategic and change initiatives and implementation techniques. Graded Pass/Fail.

NURS 700. Scientific Integrity: Responsible Conduct of Research. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment restricted to students admitted to a doctoral program. This course is intended for students to develop and refine their understanding of and skills in applying ethics and law of research, with a focus on the National Institute of Health's Office for Human Research Protections' responsible conduct of research topics.

NURS 701. Statistical Methods for Nursing Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Provides knowledge about data management, basic statistical tests, graphics and tables, and necessary software. Presents statistical tests: contingency table analysis, one- and two-sample t-tests, one- and two-factor analysis of variance, simple linear regression, multiple linear regression, and analysis of covariance. Defines selected statistical terminology and concepts. Uses data from relevant studies to illustrate various statistical tests and corresponding assumptions.

NURS 702. Advanced Statistical Concepts for Nursing Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 701. Presents advanced statistical methods and necessary statistical assumptions. Explains optimal modeling approaches for different data types and study designs. Data types: binary data, ordinal data, multinomial data, time-to-event data, longitudinal data, hierarchical data and multivariate data. Analytic methods discussed will include nominal, ordinal and multinomial logistic regression, Kaplin-Meier estimation, Cox proportional hazards model, mixed effects models, factor analysis, principal components, canonical correlation, classification and clustering.

NURS 703. Philosophy of Human Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the doctoral program in nursing. Critically analyzes philosophic perspectives and their relationship to human sciences; emphasizes analysis of the underlying epistemology and ontological assumptions of various philosophies. Explores philosophies of science and their influence on the emergence of knowledge in the human sciences, using nursing science as an example.

NURS 704. Analysis and Construction of Theory for Nursing Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 703. This course focuses on analysis and critique of theoretical and conceptual foundations of research and the development process associated with constructing nursing disciplinary knowledge. Emphasis is placed on the processes for concept and theory development within the context of a research trajectory relevant to the discipline.

NURS 720. Foundations of Biobehavioral Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 704 or permission of instructor. This course provides a foundation for critically examining and developing research frameworks and models used to conduct biobehavioral research. The course explores assumptions about the dimensions, interactions and outcomes of biology and behavior from basic science through interventional approaches. This course discusses current applications of biobehavioral research including translational research to improve nursing practice and clinical outcomes.

NURS 721. Advanced Concepts in Biobehavioral Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 720 or permission of instructor. This course focuses on applying concepts and measures used in biobehavioral research. It also discusses biobehavioral research priority areas, current methods and data sources. In addition, students will evaluate the types of measures used in biobehavioral research and relate these to their own focus areas. Students will apply their knowledge from the prerequisite course to develop a research proposal incorporating a research framework, concepts and measures, and methods used in biobehavioral research.

NURS 725. Synthesis and Emerging Trends in Scientific Inquiry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 720 and NURS 721, or NURS 731 and NURS 732, or permission of instructor. This course explores emerging trends in different areas of scientific inquiry to help students develop their understanding of the current and evolving research environment. Designed to synthesize the current state of the science and apply it to the student's area of research. In addition, the student will apply approaches to incorporating emerging trends into an individualized research program and strategic career development.

NURS 731. Foundations in Health Care Quality Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 704 or permission of instructor. This course provides a foundation for critically examining and developing research frameworks and models used to conduct health care quality of research. The course explores assumptions about health care quality, its dimensions and outcomes at the individual, organizational and population levels. Different approaches to health care quality research will be discussed. Finally, current applications of quality research to policy, health system accountability and various levels of the provision of health care are reviewed.

NURS 732. Advanced Concepts in Health Care Quality Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: NURS 731 or permission of instructor. This course focuses on applying concepts and measures used in quality health services research. It also discusses health care quality research priority areas, current quality and safety measures, and data sources. In addition, students will evaluate the types of quality and safety measures used in health care quality research and relate these to their focus areas. Students will apply their knowledge from the prerequisite course to develop a research proposal incorporating a research framework, concepts and measures, and methods used in health care quality research.

NURS 770. Quantitative Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 701 or permission of instructor; corequisite: NURS 702. This course provides knowledge and skills for identifying and selecting appropriate designs for quantitative health care research. The course analyzes major groups of research designs for fit with various types of research questions. This course examines strengths and weaknesses of the groups of research designs. Focuses on elements of research design that enhance rigor.

NURS 772. Qualitative Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course provides knowledge and skills for the design and implementation of qualitative health research and the management and analysis of qualitative data. The course analyzes various research designs for ability to generate scientifically rigorous findings related to nursing or health care. This course explores current challenges, debates and controversies in qualitative research.

NURS 773. Perspectives on Research Design. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: NURS 703 and NURS 704. Analyzes philosophical foundations of a variety of research designs. Explores assumptions underlying the selection and evaluation of quantitative, qualitative and mixed-methods designs. Focuses on the epistemological, ontological and methodological foundations of research design and implications for knowledge development.

NURS 776. Research Program Development Seminar I. 2 Hours.
Seminar course; 1 lecture and 2 seminar hours. 2 credits. Prerequisite: admission to the doctoral program in nursing. Explores the multiple roles in establishing a program of research and the various career-development stages of a scholar. Defines an area of inquiry for knowledge development within a focus area.

NURS 777. Research Program Development Seminar II. 2 Hours.
Seminar course; 1 lecture and 2 seminar hours. 2 credits. Prerequisite: admission to the doctoral program in nursing. Analyzes and integrates the state of knowledge development in a selected area of inquiry. Develops an individualized trajectory of scholarly career development.

NURS 778. Research Program Development Seminar III. 2 Hours.
Seminar course; 1 lecture and 2 seminar hours. 2 credits. Prerequisite: admission to the doctoral program in nursing. Focuses on collaboration within the research team and in the larger research community, leadership in the research team, the peer-review process and knowledge dissemination for the advancement of a program of research.

NURS 791. Special Topics. 3-6 Hours.
Semester course; variable hours. 3-6 credits. May be repeated. Prerequisite: admission to the doctoral program in nursing. Explores specific topics in nursing.

NURS 792. Directed Research Inquiry. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Course may be repeated. A minimum of 3 credits is required as a substitute for a required focus of inquiry course. A maximum of 6 credits is allowed per semester. Prerequisite: admission to doctoral program in nursing and permission of the instructor. Provides a mentored independent study in a selected theoretical or conceptual area of inquiry within the context of a student's research focus. The purpose of this course is to increase the student's knowledge in a selected theoretical or conceptual area. This directed study will be developed under the supervision of a member of the graduate faculty. Graded as P/F.

NURS 796. Directed Research Experience. 1-9 Hours.
Semester course; variable hours. 1-9 credits. A minimum of 2 credits is required by the completion of course work. Prerequisite: admission to the doctoral program in nursing and permission of the instructor. Provides a mentored research experience in areas of faculty research expertise. The purpose of this course is to increase the student's exposure to and involvement in research under the direction of a graduate faculty member who is actively engaged in a research project. This mentored research experience will be developed under the supervision of a member of the graduate faculty. May be taken in the semester(s) the student is preparing for the comprehensive exam and for dissertation preparation prior to admission to candidacy. Graded as P/F.

NURS 797. Practicum in Nursing Research. 1-3 Hours.
Semester course; 1-3 practicum hours (45-135 clinical/lab hours). 1-3 credits (1-3 clinical lab credits). May be repeated. Prerequisite: NURS 700 or permission of instructor. Enrollment restricted to students admitted to a doctoral program and by permission of instructor. This course focuses on the development of skills and techniques for the conduct of research through active participation in either an ongoing faculty research project or an element of the student's research area. The practicum is structured individually through discussion with the supervising faculty member. Emphasis is on the practical application of research skills and growth in knowledge related to the conduct of research. Graded as Pass/Fail.

NURS 898. Dissertation. 1-13 Hours.
Semester course; 1-13 dissertation hours. 1-13 credits. Enrollment restricted to students who have been admitted to candidacy. A minimum of 13 credits is required. Original research conducted under the supervision of an adviser and in conjunction with a dissertation committee. Graded as satisfactory/unsatisfactory.

School of Pharmacy

Medicinal Chemistry (MEDC)

MEDC 526. Research Techniques in Medicinal Chemistry. 1-4 Hours.
Semester course; 0-2 lecture and 2-8 laboratory hours. 1-4 credits. The theory and application of classical, instrumental, and computer techniques used in medicinal chemistry research are presented.

MEDC 527. Basic Pharmaceutical Principles for the Practicing Pharmacist. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines basic science principles in organic chemistry and biological chemistry as specifically related to the pharmaceutical treatment of disease.

MEDC 530. Bioinformatics and Genomics in Drug Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the basic elements of cellular pathways and drug interactions, and how modern genomics comes into play. Presents bioinformatics principles being used every day in data-intensive fields of research. Introductory and concept-oriented, the course will prepare students for grasping how bioinformatics is being used in many areas of biomedical sciences. Geared toward students coming from a variety of backgrounds in biology, biochemistry and chemistry. While many of the analytical approaches are statistical in nature, there is no requirement for a background in statistics or mathematics. Each student will have the opportunity to design a small project applying bioinformatics concepts. Crosslisted as: BNFO 530.

MEDC 532. Medicinal Chemistry for Nurse Anesthetists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A review of the principles of organic chemistry and bio-organic chemistry presented as a series of lectures covering the structure-activity relationships, metabolism, and mechanism of action of selected agents.

MEDC 533. Pharmacognosy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Designed to introduce the basic concepts of pharmacognosy that apply to crude drugs and semipurified and purified natural products that are typically available in pharmacies. The regulation of herbal products and evaluation of the purity and biovailability of alternative and complementary medicines will be discussed.

MEDC 541. Survey of Molecular Modeling Methods. 1 Hour.
Semester course; lecture and laboratory hour. 1 credit. Introduces computational chemistry and molecular graphics with the current software used for drug design and small molecule/large molecule interactions. Computational chemistry problems will be emphasized in the laboratory.

MEDC 542. Biotechnology-derived Therapeutic Agents. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides the fundamentals of biotechnology-derived biological agents including structure, manufacture, stability, analysis, formulation and usage. Selected examples of biological agents in current and future therapy may also be covered.

MEDC 543. Clinical Chemistry for the Pharmacist. 1 Hour.
Semester course; 1 lecture hour. 1 credit. A study of the underlying principles and practical limitations of analytical procedures with emphasis on evaluation of over-the-counter analytical products currently sold or used in pharmacies and assays of organ pathophysiology used in hospitals.

MEDC 553. Clinical Therapeutics Module: Introduction to Medicinal Chemistry. 1 Hour.
Module course; variable lecture hours. 1 credit. Introduces topics in medicinal chemistry common to all drug classes, including structure activity relationships, principles of drug action, drug design and drug metabolism. Drugs acting on the autonomic nervous system are presented as a case study illustrating applications of the general principles.

MEDC 555. Fundamentals of Drug Discovery I. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Students will work individually or in groups to learn the fundamentals of medicinal chemistry and drug discovery. The course utilizes formal lectures, informal group discussions, literature research and formal oral and/or written assignments to impart knowledge and practice of drug discovery. The course focus will be on molecular biology and pharmacological aspects of medicinal chemistry.

MEDC 556. Fundamentals of Drug Discovery II. 3.5 Hours.
Semester course; 3.5 lecture hours. 3.5 credits. Students will work individually or in groups to learn the fundamentals of medicinal chemistry and drug discovery. The course utilizes formal lectures, informal group discussions, literature research and formal oral and/or written assignment to impart knowledge and practice of drug discovery. The course focus will be on methodologies and techniques of medicinal chemistry.

MEDC 591. Special Topics in Medicinal Chemistry. 3.5 Hours.
Semester course; 1-3.5 credits. An elective course in which students may choose to participate in individual or group study in one or more areas of medicinal chemistry. The course can take the form of formal lectures, informal group discussions, literature research, and/or laboratory research. Students must have the permission of the individual instructor before registering for this course.

MEDC 601. Advanced Medicinal Chemistry I. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course is designed to expose graduate students to the history and practice of medicinal chemistry with an emphasis on drug development, design, structure-activity relationship studies and their association with diseases to prepare students for future work in academia or industry.

MEDC 609. Advanced Organic Synthesis: A Target-oriented Approach. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. A study of chemical transformations in organic chemistry, their mechanisms and their application to the synthesis of complex target molecules.

MEDC 610. Advanced Medicinal Chemistry II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: MEDC 601 or permission of instructor. Introduces concepts for understanding the medicinal chemistry of the central nervous system.

MEDC 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: PCEU 614/PHAR 614.

MEDC 620. Advanced Medicinal Chemistry III. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: MEDC 601 or the permission of the instructor. Reviews the concepts necessary for enzyme inhibitor design. Emphasizes the design of new agents to treat disease states by enzyme inhibition.

MEDC 630. Theoretical Methods in Drug Design. 2 Hours.
Semester course; lecture and laboratory hours. 2 credits. Prerequisites: MEDC 601, MEDC 610 or MEDC 620, or permission of instructor. A study of the theoretical methods of drug structure-activity analysis, including molecular orbital theory, topological indexes and physical property correlations. Computational chemistry problems will be emphasized in the laboratory.

MEDC 642. Nucleoside, Nucleotide, Carbohydrate and Peptide Chemistry. 3 Hours.
Semester course; 1 lecture hour. 1 credit. Surveys nucleoside, nucleotide, carbohydrate and peptide chemistry with emphasis on their synthesis.

MEDC 643. Regioselective Drug Metabolism. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Surveys drug biotransformation reactions. Emphasizes the molecular aspects of Phase I and Phase II drug metabolism.

MEDC 644. Asymmetric Synthesis. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Reviews the major asymmetric chemical transformations, including mechanisms, scope and synthetic utility.

MEDC 645. Introduction to Heterocyclic Chemistry. 3 Hours.
Semester course; 1 lecture hour. 1 credit. Introduces the chemistry of heterocyclic compounds. Emphasizes heterocyclic nomenclature and the reactions/reactivity of heterocyclic systems.

MEDC 670. Advanced Molecular Modeling Theory and Practice. 3 Hours.
Semester course; 3 lecture/laboratory hours. 3 credits. Prerequisite: MEDC 641 or permission of instructor. Examines the principles and application of computational chemistry and molecular graphics to current problems in drug design. Lectures focus on the application of specific computational methods and techniques to solve problems in drug/molecular design. Workshop sessions provide hands-on experience using state-of-the-art hardware and software for molecular modeling.

MEDC 690. Departmental Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Reports presented by students, staff and visiting lecturers, current problems and developments in pharmaceutical and medicinal chemistry are discussed. Graded as PR in first semester of enrollment, with a letter grade assigned in the following semester.

MEDC 691. Special Topics in Medicinal Chemistry. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. Lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as a part of the research training.

MEDC 697. Directed Research in Medicinal Chemistry. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree.

Pharmaceutical Sciences (PSCI)

PSCI 607. Introduction to Pharmaceutical Sciences From Bench to Shelf. 1 Hour.
Continuous courses; 2 credits offered: 1 credit hour each in fall and spring. These two courses will be run as if they were a single 2-credit course spanning two semesters. Students will be introduced to the drug discovery process, both conventional and contemporary, and learn about all the aspects of drug development from drug design to drug approval, production and marketing. Each topic will be introduced by either a faculty member or an expert from the pharmaceutical industry. Active discussion will be encouraged during each session. PSCI 607 graded as PR; PSCI 608 graded S/U/F upon completion.

PSCI 608. Introduction to Pharmaceutical Sciences From Bench to Shelf. 1 Hour.
Continuous courses; 2 credits offered: 1 credit hour each in fall and spring. These two courses will be run as if they were a single 2-credit course spanning two semesters. Students will be introduced to the drug discovery process, both conventional and contemporary, and learn about all the aspects of drug development from drug design to drug approval, production and marketing. Each topic will be introduced by either a faculty member or an expert from the pharmaceutical industry. Active discussion will be encouraged during each session. PSCI 607 graded as PR; PSCI 608 graded S/U/F upon completion.

PSCI 691. Special Topics in Pharmaceutical Sciences I. 0.5-5 Hours.
Semester course. 0.5-5 lecture hours. 0.5-5 credits. Subject matter is presented by lecture, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training. Graded S/U/F.

PSCI 692. Special Topics in Pharmaceutical Sciences II. 0.5-5 Hours.
Semester course; 0.5-5 lecture hours. 0.5-5 credits. Subject matter is presented by lecture, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training.

Pharmaceutics (PCEU)

PCEU 501. Pharmaceutical Calculations. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course is designed in a student-centered learning format that supports self-directed learning. The course will help students develop the skill set needed to screen out the distractors from the determinant variables in a statement problem and guide their thought processes in sequential use of information to solve calculation problems seen in pharmacy practice.

PCEU 507. Pharmaceutics and Biopharmaceutics I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Designed to describe the physico-chemical and biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms. Topics will include pharmaceutical calculations, solid-state properties, solubility, partitioning, solution properties, disperse systems, micromeritics, diffusion, dissolution and release rates, drug and dosage form stability and degradation, pharmaceutical manufacture, and compounding.

PCEU 508. Pharmacokinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Corequisite: PCEU 509. Major topics include the mathematical and physiological principles of pharmacokinetics related to the development and use of pharmaceutical dosage forms. Discussions will include compartmental modeling, physiological concepts of pharmacokinetics, and clearance and absorption concepts. Also includes material related to statistics.

PCEU 509. Pharmaceutics and Biopharmaceutics II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PCEU 507. Designed to describe the biopharmaceutical principles fundamental to the development of pharmaceutical dosage forms, including parenteral products, solutions, disperse systems, semisolids, solids and novel drug delivery systems. The formulation, manufacture, control, biopharmaceutics and relevant patient-pharmacist interactions of the major dosage forms will be addressed and presented by route of administration.

PCEU 604. Molecular Pharmaceutics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of course coordinator. The student's basic biochemistry and pharmacy education will be expanded with emerging molecular concepts in enzyme and transporter structure and function, roles in drug disposition, pharmacogenomics, biochemistry, molecular biology, and experimental techniques.

PCEU 612. Advanced Physical Pharmacy and Biopharmaceutics. 3-5 Hours.
Semester course; 3 credits. Phase equilibria and phase transfer kinetics related to biopharmaceutics will be covered. The relationship between physiochemical properties of a drug dosage form and drug absorption, along with the correlation between in vitro tests used to evaluate dosage forms an in vitro measures of drug absorption will be covered. The course assumes that the student has a basic understanding of pharmacokinetics, physical chemistry and statistics.

PCEU 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: MEDC 614/PHAR 614.

PCEU 615. Applied Pharmacokinetics. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. Extends the concepts of pharmacokinetics as applied to dosage regimen design, pharmacokinetic variability, drug interactions and statistical strategies for individualization of drug therapy. Lectures and conferences take place throughout the semester.

PCEU 621. Advanced Pharmaceutics and Drug Disposition. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study at the advanced level of the relationships between the physiochemical properties of a drug and dosage form and the absorption, distribution, elimination and pharmacological effects of the drug. Current theory and methodology involved in solving problems at the research level are emphasized.

PCEU 622. Clinical Pharmacokinetics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. The application of current pharmacokinetic theory to clinical problems involved in optimizing and monitoring drug use in patients. Particular attention is given to adjustment of drug dosage in individual patients with impaired drug elimination due to renal and hepatic dysfunction. (Nontraditional program).

PCEU 624. Advanced Pharmacokinetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An advanced treatment of the kinetics of drug absorption, distribution, and elimination utilizing mathematical models, and digital computers for analysis of linear and nonlinear biologic systems.

PCEU 625. Pharmaceutical Analysis. 2 Hours.
Semester course; 1 lecture and 1 laboratory hours. 2 credits. Theory and practice of selected analytical techniques for the quantitative analysis of drugs in body fluids and other matrices. Emphasis is on method validation, and immunoassay methodologies. Laboratory sessions will provide "hands on" experience with modern methods of drug analysis.

PCEU 626. Pharmaceutical Analysis Laboratory. 1 Hour.
1 lecture hour. 1 credit. Prerequisite: PHAR 625. A continuation of PHAR 625 with emphasis on providing advanced topics for analysis of drugs and metabolites.

PCEU 690. Pharmaceutics Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Required of all graduate students in pharmaceutics. Research Seminar.

PCEU 691. Special Topics in Pharmaceutics. 1-5 Hours.
Semester course; 1-5 lecture hours. 1-5 credits. Presentation of subject matter is by lectures, tutorial studies, and/or library assignments in selected areas of advanced study not available in other courses or as part of the training in research.

PCEU 697. Directed Research in Pharmaceutics. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S., Pharm.D., or Ph.D. degree.

Pharmacy (PHAR)

PHAR 509. Evidence-Based Pharmacy I: Introduction to Pharmacy Information Skills. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. This is the first of a three-course series introducing students to information skills necessary for the practice of evidence-based pharmacy. Lecture topics include drug information resources, efficient information retrieval, assessment of drug information sources, relationship of pharmaceutical industry to drug literature, and basic laws and regulations associated with prescription processing. Class exercises will be used to promote the appropriate use of drug information resources in pharmacy practice.

PHAR 512. Health Promotion and Disease Prevention. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Introduction to the role of the pharmacist in health promotion and disease prevention. Skills for pharmacist involvement in implementing aspects of Healthy People 2010, educating patients and addressing health care disparities will be emphasized.

PHAR 513. Contemporary Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. The goal of the course is to introduce students to basic principles of professional patient-centered pharmacy practice. The common thread between the various topics is the link between pharmacists' professionalism and effective medication use. Pharmacists who consistently engage in professional behaviors are better able to serve the health care needs of their patients.

PHAR 515. Continuous Professional Development I. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the first of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 523. Foundations I. 1.5 Hour.
Semester course; 4.5 laboratory hours. 1.5 credits. This competency-based course is intended to give the first-year pharmacy student an introduction to the pharmacy profession, emphasizing the skills and values that are necessary to be a competent, caring pharmacist. It is the first in a six-semester practice-based course sequence that introduces the language and tools of contemporary pharmacy practice with an emphasis on calculations, communication, medical terminology, drug information, prescription processing, health promotion, patient assessment and problem solving.

PHAR 524. Foundations II. 1.5 Hour.
Semester course; 4.5 laboratory hours. 1.5 credits. This competency-based course is the second in a six-semester practice-based course sequence with an emphasis on the preparation and dispensing of selected extemporaneous compounds including liquid, solid and semisolid preparations and the appropriate use of selected OTC point-of-care devices.

PHAR 525. Communications in Pharmacy Practice. 2 Hours.
Semester course; 1.5 lecture hours and an average of 1 conference hour per week. 2 credits. A study of the theory and techniques of communication and counseling techniques related to pharmacy practice. Supervised practice in developing basic communication skills.

PHAR 526. Community Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Helps students develop the necessary foundation for the management of activities in community pharmacy practice settings with many of the skills developed in this course being equally applicable to other practice settings. Focuses on financial management and managed care as it affects community practice.

PHAR 529. Clinical Therapeutics Module: Introduction to Special Populations. 2 Hours.
Module course; 2 lecture hours. 2 credits. Introduction to issues affecting the pharmacotherapy of special populations such as pediatric and geriatric patients.

PHAR 530. Introductory Pharmacy Practice Experience: Community Practice. 4 Hours.
Semester course; daily for 4 weeks. 4 credits. Students will meet with an assigned community pharmacist 5 days per week for 8 hours for 4 consecutive weeks at the end of the P-1 year. Students will practice pharmacy under supervision while learning about the medication use system in community pharmacy practice. Students will demonstrate core practice skills: communication, pharmacy calculations, ethics, medication safety, wellness and health promotion, informatics and critical thinking. Graded as honors, high pass, pass, fail.

PHAR 532. Introductory Pharmacy Practice Experience: Hospital Practice. 3 Hours.
Semester course; 40 hours per week for three weeks. 3 credits. Students will meet with an assigned hospital pharmacist for a three-week (120 hours) experience at the end of the P-2 year to practice pharmacy in a hospital environment and learn about hospital pharmacy management and medication distribution systems. Students will demonstrate core practice skills: communication, calculations, ethics, medication safety, technology, informatics and critical thinking. Graded as honors, high pass, pass, fail.

PHAR 533. Introductory Pharmacy Practice Experience: Patient Care. 0.5 Hours.
Semester course; 0.5 laboratory hours. 0.5 credits. Students will complete 20 hours of approved experiences under supervision. An orientation, reading assignments, mandatory class time and assessments will be conducted. Students will also prepare a reflection describing the benefits to the community when pharmacists engage in the health and education needs of the community. Students will develop a sense of personal responsibility for addressing the problems and needs of society. Graded as Pass/Fail.

PHAR 534. Foundations III. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the third in a six-semester, practice-based course sequence with an emphasis on the clinical application of medications in the management of various disease states. The second-year pharmacy student will develop skills in the assessment and therapeutic monitoring of selected disease states and drug therapies. Topics include cardiovascular, endocrine and pulmonology therapeutics.

PHAR 535. Foundations IV. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the fourth in a six-semester, practice-based course sequence. Introduces students to the skills required to practice in institutional settings such as hospitals and long-term care facilities and in home health care.

PHAR 540. Self-Care and Alternative and Complementary Treatments. 2.5 Hours.
Module course; variable lecture and conference hours. 2.5 credits. Introduction to the concepts of self-care and alternative and complementary treatments. Students will learn to distinguish treatable signs and symptoms of common diseases and exclusions for care that require referral to appropriate health care practitioners. Non-medication methods to alleviate and prevent self-care problems are reviewed. Patient cases, self-care consultations, lectures and conferences will be used to facilitate learning.

PHAR 541. Patient Assessment in Pharmacy Practice. 2 Hours.
Semester course; variable lecture and laboratory hours. 2 credits. Provides students with an introduction to patient assessment skills necessary in patient-centered pharmacy practice. Course topics include basic physical assessment techniques, interpretation of findings from laboratory tests or physical examinations and documenting findings from patient assessments. Laboratory time will be used to practice various assessment skills. The course will also build on communication and information skills presented in previous courses.

PHAR 544. Clinical Therapeutics Module: Cardiovascular. 4.5 Hours.
Module course; variable hours. 4.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with cardiovascular diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 545. The U.S. Health Care System. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open to professional students only. Designed to introduce the student to the components of the U.S. health care system and the interrelationships among health care consumers and providers. It also presents the organizational framework and regulatory and reimbursement mechanisms which are the foundations of the U.S. health care delivery system. A unique feature of this course is the interdisciplinary teaching team.

PHAR 547. Managing Professional Patient-centered Practice. 1.5 Hour.
Semester course; 1.5 lecture hours. 1.5 credits. Introduces pharmacy students to the basic principles of managing a professional pharmacy practice. Students will learn patient-centered practices associated with effective medication use and positive patient outcomes. Instruction will be through lectures, case discussions and portfolio assignments.

PHAR 549. Personalized Medicine. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Provides an introduction to personalized medicine as related to pharmacy practice. The course will be taught using lectures, individual work, small-group discussions and total classroom discussion using homework, in-class assignments and patient case scenarios.

PHAR 550. Pharmacy Practice Research. 3 Hours.
Yearlong course; 3 lecture hours. 3 credits. Focuses on the development of skills necessary for identifying issues and questions related to pharmacy practice, evaluating the literature to identify possible solutions, designing a feasible research project, developing a data analysis plan and a formal written proposal for the project. Students will ultimately present their research proposals to faculty and students. The course is graded as CO with no credit for fall semester with a letter grade and credit assigned for spring semester.

PHAR 555. Clinical Therapeutics Module: Endocrinology. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with endocrine diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 556. Clinical Therapeutics Module: Neurology. 4 Hours.
Module course; variable hours. 4 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with neurological diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 565. Evidence-based Pharmacy II: Research Methods and Statistics. 2.5 Hours.
Module course; variable hours. 2.5 credits. This is the second of a three-course series introducing students to the principles and practice of evidence-based pharmacy. Lecture topics include research methods, concepts and principles of study design, and appropriate use of statistics. Class exercises promote a working understanding of statistical principles and a general understanding of research methods.

PHAR 566. Evidence-based Pharmacy III: Drug Literature Evaluation. 2 Hours.
Module course; variable hours. 2 credits. This is the third of a three-course series introducing students to the principles and practice of evidence-based pharmacy. Lectures, outside readings, class discussions and exercises will be used to develop the skills necessary for the evaluation of biomedical literature and application to pharmacy practice.

PHAR 602. Clinical Therapeutics Module: Psychiatry. 3 Hours.
Module course; variable hours. 3 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with psychiatric illnesses are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 603. Clinical Therapeutics Module: Respiratory/Immunology. 3 Hours.
Module course; variable hours. 3 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with respiratory and immunologic illnesses are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 604. Clinical Therapeutics Module: Infectious Diseases. 4.5 Hours.
Module course; variable hours. 4.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with infectious diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 605. Clinical Therapeutics Module: Hematology/Oncology. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with hematologic diseases and cancer are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 606. Clinical Therapeutics Module: Nephrology/Urology. 2 Hours.
Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with kidney and urologic diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 607. Clinical Therapeutics Module: Dermatology/EENT and Joint. 2 Hours.
Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with diseases of the bone, skin, ears, eyes, nose and throat are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 614. Research Techniques. 1-4 Hours.
Semester course; variable hours. Variable credit. Credit will be given on the basis of 1 credit per 45 hours of laboratory time. Prerequisite: approval of research adviser. Provides new graduate student with the laboratory skills necessary to perform research in the chosen discipline. The training time required will depend upon the discipline. Graded as pass/fail. Crosslisted as: PCEU 614/MEDC 614.

PHAR 615. Continuous Professional Development II. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the second of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 618. Clinical Therapeutics Module: Gastrointestinal/Nutrition. 2.5 Hours.
Module course; variable hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with gastrointestinal diseases are integrated in this course. Nutrition will be covered. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 619. Clinical Therapeutics Module: Women's Health/Bone. 2 Hours.
Module course; variable hours. 2 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in women's health issues and patients with bone diseases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, non-prescription and complementary treatments will be reviewed.

PHAR 620. Clinical Therapeutics Module: Critical Care/Toxicology and Complex Patients. 2.5 Hours.
Module course; 2.5 lecture hours. 2.5 credits. The principles of medicinal chemistry, pharmacology, pharmaceutics, pathophysiology and pharmacotherapy to the application of drug therapy in patients with critical care diseases, toxicology emergencies and complex cases are integrated in this course. The clinical presentation, course of illness, prevention and treatment of diseases using prescription, nonprescription and complementary treatments will be reviewed.

PHAR 621. Pharmacoeconomics. 2 Hours.
Module course; variable hours. 2 credits. Introduces the terms and processes of pharmaceutical economics and phamacoeconomics. Students learn to assess the impact of economics on phamaceutical use, evaluate pharmacoeconomic studies and make decisions on the cost effectiveness of therapeutic alternatives. Lectures, discussion and class assignments.

PHAR 622. Epidemiology and Pharmacy Practice. 2 Hours.
Module course; variable hours. 2 credits. Introduction to the principles of epidemiology and the relation to pharmacy practice. Emphasis on applications of epidemiologic principles in pharmacy. Lectures, outside readings, class discussions and exercises.

PHAR 623. Patient Medication Safety. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Provides the fundamental background necessary to understand patient medication safety, including multidisciplinary responsibilities for medication safety and approaches to the management and prevention of medication errors. Current issues in medication safety and actual medication error cases will be used in the class.

PHAR 626. Advanced Pharmacotherapy Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of the instructor. This course focuses on research techniques used to assess the clinical response to drug therapy, including advantages and disadvantages of different techniques. Published clinical trails are evaluated to illustrate these concepts including statistical assessment. Recent FDA New Drug Applications are reviewed when appropriate to illustrate regulatory aspects of the evaluation of clinical trials.

PHAR 631. Advanced Pharmacy Practice Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Classical, social, and systems views of management are introduced with emphasis on the uses of implicit control. The sociology of professions and the nature of professional work are explored; the management of the professional's work is discussed in detail. Design and operation of integrated drug information, drug distribution, and drug use control systems is explored. (Nontraditional program).

PHAR 637. Introduction to Research Methods in Pharmaceutical Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Assists practicing pharmacist managers and researchers in the development, implementation, monitoring and evaluation of programs for the delivery of pharmaceutical care and the practice of pharmacy. Introduces students to the empirical method and to provide them with a fundamental knowledge base for developing salient research questions that could lead to the articulation of testable research hypotheses, accomplished by addressing those research techniques and designs most commonly used in pharmacy and health services research.

PHAR 638. Pharmaceutical Benefit Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Addresses the need for pharmacy benefit management, the types of organizations that use pharmacy benefit management and the primary tools, techniques and practices used to manage the pharmacy benefit. Presents through lectures, readings, class discussions and a research paper.

PHAR 640. Foundations V. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the fifth in a six-semester practice-based course sequence with an emphasis on the clinical application of medications in the management of various disease states. The third-year pharmacy student will develop skills in the assessment and therapeutic monitoring of selected disease states and drug therapies. Topics include psychiatry, neurology and oncology therapeutics.

PHAR 645. Foundations VI. 1.5 Hour.
Semester course; 1 lecture and 2 laboratory hours. 1.5 credits. This competency-based course is the final installment in a six-semester, practice-based course sequence. It is intended to give the third-year pharmacy student opportunities to improve acquired skills and gain additional skills necessary to provide the highest level of patient-centered care by optimizing drug therapy outcomes.

PHAR 651. Medical Access and Care for Underserved Populations. 3 Hours.
Semester course; lecture and experiential hours. 3 credits. Provides an overview of the issues affecting medical access for underserved populations, with an emphasis on homeless patients. Topics covered include resources, unique barriers, health literacy, interdisciplinary models in safety net organizations and medication reconciliation. Students attend lectures and complete experiential exercises to reinforce these topics, as well as creating patient education materials.

PHAR 652. Health Promotion and Communication in Pharmacy Practice. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. An introduction to the role of the pharmacist in health promotion and disease prevention and building communication skills to help prepare students for practice. Supervised practice in developing basic communication skills. Skills for pharmacist involvement in implementing aspects of Healthy People 2020, educating patients and addressing health care disparities will be emphasized.

PHAR 660. Community Pharmacy Practice Management II. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Helps students develop the necessary foundation for the management of activities in community pharmacy practice settings with many of the skills developed in the course being equally applicable to other practice settings. This course focuses on developing and marketing community pharmacy services.

PHAR 661. Institutional Pharmacy Management. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Introduces students to the practice and management of pharmacy in institutional settings -- hospitals, long-term care facilities, managed care settings and home health care. Students will learn issues unique to institutional practice and best practices for improving medication therapy in institutions. Faculty presentations, guest lectures, class exercises and outside assignments.

PHAR 662. Leadership and Advocacy. 2 Hours.
Semester course; 2 credits. Provides leadership and political advocacy development for students, including the officers of student organizations and those who wish to become leaders in the profession. Students will examine leadership as they explore current health care issues and gain direct experience in community action and the political advocacy process. From a broad perspective, all health care professions need effective leadership, and in turn effective political advocacy, to deal with the numerous issues facing the health care system. Many students are seeking new ways to understand and solve local and national problems, to demystify politics and to make concrete changes by having direct contact with public individuals. To meet these needs, the goals of this course are to strengthen the leadership ability of students and to enhance their potential for future leadership and advocacy roles within their profession and their communities. Graded H/P/F.

PHAR 663. Advanced Diabetes Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An in-depth study of the care of patients with metabolic syndrome and diabetes. The etiology, pathophysiology, clinical course, clinical manifestations, prevention and management of diabetes will be reviewed through the use of online didactic presentations, patient cases, self-directed learning and active participation in classroom discussion. Emphasis is placed on the use of data to optimize pharmacotherapy for patient scenarios.

PHAR 666. Advanced Topics in Pharmacy. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Presentation of pharmacy subject matter by lectures, conferences or clinical site visits in selected areas of advanced study providing a discussion of topics beyond that provided in the required curriculum.

PHAR 670. Geriatric Pharmacy Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Students learn therapeutic aspects of providing health care to elderly people. Sociobehavioral aspects of aging related to pharmacotherapy outcomes also will be learned. Problems associated with drug use in the elderly and the importance of providing quality pharmaceutical care to ambulatory and institutionalized geriatric individuals will be emphasized.

PHAR 671. Applied Pharmacoeconomics and Outcomes Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Presents theoretical and practical topics relating to pharmacoeconomics and health outcomes research. Students will learn to critically appraise and discuss pharmaceutical outcomes research through lectures, readings, class participation and projects. Requires students to plan, initiate and present an outcomes research project that considers both clinical and economic issues of product or service selection.

PHAR 672. Advances in Mental Health Pharmacy Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Students choose the topics for discussion in this elective course. They actively learn through small group discussions of the pharmacotherapy of psychiatric disorders. Students gain experience in patient rounds, practice-based projects, interpretation of clinical practice guidelines, use of the Internet and computer presentations.

PHAR 673. Advanced Cardiovascular Pharmacotherapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: PHAR 544. Students will gain a broader knowledge and deeper understanding of the etiology, pathophysiology, clinical course, clinical manifestations, prevention and management of cardiovascular disorders through the use of online didactic presentations, videos, patient cases, self-directed learning and active participation in classroom discussion.

PHAR 674. Advances in Community Pharmacy Practice and Therapeutics. 3 Hours.
Semester course; 2 lecture and 1 conference hours. 3 credits. This course will enable students to enhance their community practice and patient care skills. It will address strategies for marketing and documentation of clinical services including disease management, wellness and screening programs pertinent to community pharmacy practice. Students will visit community pharmacies for the practice component of this course.

PHAR 677. Infectious Diseases Pharmacotherapy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is designed to familiarize the student with principles of the rational treatment of human infectious diseases. Emphasis will be placed on learning the pharmacology, toxicology and pharmacokinetics/pharmacodynamics of antimicrobial agents; problems of antimicrobial resistance and the role of the pharmacist in combating resistance; the methods of obtaining and evaluating culture and susceptibility reports; and familiarity with infectious diseases literature. Students will attend daily consultation rounds with the infectious diseases service and will meet with the preceptor to discuss patients and plan for contributions to patient care.

PHAR 678. Women's Health: Pharmacotherapeutic Issues and Controversies. 2.5 Hours.
Semester course; 2 lecture hours. 2.5 credits. This course addresses the prevention and management of disease in women. It is designed to expand upon the women's health topics presented in the pharmacotherapy course series. Problem-based learning, student presentations and clinical projects serve as the primary teaching methods.

PHAR 679. Critical Care Pharmacotherapy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course consists of online recorded discussions and case presentations to familiarize the student with critical care pharmacotherapy. In addition to a discussion of various disease states, information will be provided about the critically ill patient, the environment of the intensive care unit and the role of the critical care pharmacist. The course is presented in a self-study, online format. Graded as H/P/F.

PHAR 685. Contemporary Topics in Pharmacy. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Explores how pharmacists prepare for and respond to the issues that affect the practice of pharmacy. Contemporary issues that relate to major health care needs, government health care activities, views by health professionals, health policies, health care economics, pharmacist attitudes and behaviors, pharmacy laws and regulations, pharmacy traditional views and opinions will be examined. Discussion and debate on these issues will help to prepare students for their future in pharmacy practice.

PHAR 686. Entrepreneurial Pharmacy and Independent Pharmacy Practice. 2 Hours.
Semester course; 3 lecture hours/10 weeks. 2 credits. Provides a practical review of independent pharmacy practice from starting to running a pharmacy. Topics include financing, marketing, niche markets, store design and merchandising, technology, business relations, and contracts. The course will be taught through presentations/discussions by guest lecturers and a project.

PHAR 687. Introduction to Research in Pharmacy. 1 Hour.
Semester course; 1 lecture hour. 1 credit. A broad overview of the types of research conducted in the profession of pharmacy with a focus on clinical research. Students will achieve a broad appreciation of the research opportunities available in pharmacy and guidance in pursuit of a career in research. Format will consist of lectures, interactive discussions and demonstrations. Graded P/R.

PHAR 688. Applied Pharmacoepidemiology Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and BIOS 544 or permission of instructor. Provides an overview of the field of pharmacoepidemiology and its relationship to health care and research. Topics including selecting data sources, study design, data manipulation and analytical issues relevant to the conduct of pharmacoepidemiology research are covered. Students complete exercises to reinforce these topics, as well as prepare a formal project proposal. Research studies are also reviewed to help students develop skills in the critical evaluation of the pharmacoepidemiology literature.

PHAR 689. Pharmaceutical Policy Analysis. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ECON 500 or ECON/HADM 624, or permission of instructor. Examines a breadth of pharmaceutical policy issues pertaining to stakeholders in health care including the federal government, state governments, the pharmaceutical industry, pharmacies and pharmacists, and consumers. Using an economic approach to policy analysis, various competing thoughts and challenges to health care will be presented. Special attention will be paid to theoretical foundations and scientific rigor in approaching policy analysis.

PHAR 690. Pharmacy Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Required of all graduate students in pharmacy. Research seminar.

PHAR 691. Special Topics in Pharmacy. 1-5 Hours.
Semester course; 1-5 lecture hours. 1-5 credits. Presentation of subject matter is by lectures, tutorial studies and/or library assignments in selected areas of advanced study not available in other courses or as part of the research training. Graded as honors, high pass, pass, fail.

PHAR 697. Directed Research in Pharmacy. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S., Pharm.D., or Ph.D. degree.

PHAR 715. Continuous Professional Development III. 1 Hour.
Yearlong course; 1 lecture hour. 1 credit. This the third of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance self-awareness and professionalism in student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 724. Pharmacy Law. 2.5 Hours.
Semester course; 2.5 lecture hours. 2.5 credits. A study of federal and state laws, including statutes, regulations and cases, affecting the practice of pharmacy and the distribution of drugs. This course includes material on ethics.

PHAR 730. Continuous Professional Development IV. 0.5 Hours.
Yearlong course; 0.5 lecture hours. 0.5 credits. This the fourth of four yearlong courses designed to advance students' professional development. The large- and small-group sessions and co-curricular activities encompass experiences that enhance student pharmacists. Graded as CO with no credit for fall semester with a pass/fail and credit assigned for spring semester.

PHAR 760. Acute Care Pharmacy Practice I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an acute care hospital setting. Students will actively participate in the delivery of patient care on a general medicine service. Students may participate in the following types of activities: rounding with a health care team, obtaining patient histories, identifying problems requiring therapeutic interventions, solving problems, consulting with physicians, monitoring patient outcomes and providing educational sessions for the professional staff. These services are expected to be integrated with the hospital pharmacy services. Graded as H/HP/P/F.

PHAR 761. Advanced Hospital Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a hospital pharmacy department. Students will actively participate in pharmacy operations and services relating to systems for drug distribution and drug control, scope of clinical services provided by the department, management of the department, and department relationships within the institution and health system. Graded as H/HP/P/F.

PHAR 762. Geriatrics Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a variety of settings with a predominately geriatric focus. These sites may include community pharmacies, specialty clinics, rehabilitation hospitals, skilled nursing facilities, home-based consult services and assisted living facilities. Students will focus on the unique medication-related needs of seniors and actively apply that special knowledge to provide quality pharmacy care to older adults. Graded as H/HP/P/F.

PHAR 763. Ambulatory Care Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an ambulatory care, multidisciplinary practice setting. These sites may include hospital-based clinics, physician group practices, safety net clinics and managed care facilities that provide health care directly to patients. Students will actively participate in obtaining patient medical and medication histories, evaluating drug therapies, developing pharmacy care plans, monitoring patients' therapeutic outcomes, consulting with physicians and non-physician providers and providing education to patients and health care professionals. Graded as H/HP/P/F.

PHAR 764. Community Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course, students will participate in all facets of pharmacy practice in the community pharmacy setting. Students will be involved in dispensing, compounding, telephone consultation, patient counseling and nonprescription drug recommendations. Students also will be involved in patient assessment, monitoring intervention and follow-up care designed to improve the outcomes of drug therapy. Graded as H/HP/P/F.

PHAR 765. Elective I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course, students will be able to participate in a variety of pharmacy practice settings. Graded as H/HP/P/F.

PHAR 766. Elective II. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. In this course students participate in a variety of pharmacy practice settings. Graded as H/HP/P/F.

PHAR 767. Clinical Selective I. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. Restricted to Pharm.D. dual-degree candidates. In this course students participate in a clinical rotation and may choose one of these pharmacy practice settings: ambulatory care, acute care, advanced community, institutional or geriatric. Graded as H/HP/P/F.

PHAR 768. Advanced Community Pharmacy Practice. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in a community pharmacy setting. Students will focus primarily on patient care services and secondarily on patient-focused dispensing functions in these pharmacies. These services will focus on the identification, resolution and prevention of medication-related problems dealing with general medicine issues and medication therapy management. Students will actively participate in the following types of activities: interacting with patients, caregivers and prescribers; counseling, self-care consults and recommendations; administration of immunizations; and health and wellness screenings and information. Graded as H/HP/P/F.

PHAR 769. Clinical Selective II. 5 Hours.
Semester course; daily for 5 weeks (200 clinical hours). 5 credits. Restricted to Pharm.D. dual-degree candidates. In this course students participate in a clinical rotation and may choose one of these pharmacy practice settings: ambulatory care, acute care, advanced community, institutional or geriatric. Graded as H/HP/P/F.

PHAR 771. Student Pharmacist Professionalism. 1 Hour.
Continuing course; variable hours. 1 credit at end of four-year curriculum. Selected presentations and activities related to the development and enhancement of professional behavior in student pharmacists. Graded as CO until final semester, with pass/fail awarded on completion.

PHAR 773. Acute Care Pharmacy Practice II. 5 Hours.
Semester course; daily for 5 weeks. 5 credits. This course consists of 200 hours of advanced pharmacy practice experience in an acute care hospital setting. Students participate in the delivery of patient care in a general medicine or a medical specialty service. Students may participate in the following types of activities: rounding with a health care team, obtaining patient histories, identifying problems requiring therapeutic interventions, solving problems, consulting with physicians, monitoring patient outcomes and providing educational sessions for the professional staff. These services are expected to be integrated with the hospital pharmacy services. Graded as H/HP/P/F.

School of Social Work

Social Work (SLWK)

SLWK 601. Human Behavior in the Social Environment I. 3 Hours.
Semester course; 3 credits. Provides a multidimensional theoretical and evidence-based approach to understanding the complex interactions of biological, psychological, spiritual, economic, political and sociocultural forces on the lives individuals, families and groups in a multicultural society. Required core curriculum course.

SLWK 602. Policy, Community and Organizational Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Corequisite: SLWK 601. First of two foundation courses on social policy, policy practice and practice in communities and organizations. Surveys historical evolution of social welfare policy and contemporary provision of social welfare services, including the role of values in policy formulation and principles of social and economic justice. Introduces the social work role as change agent in legislative, community and organizational arenas. Uses social/behavioral knowledge and social work intervention models and applies analytical frameworks for assessing program, organizational and policy effectiveness. Develops skills in identification of need, designing strategies for change and policy analysis.

SLWK 603. Social Work and Social Justice. 3 Hours.
Semester course; 3 credits. Enhances understanding of and appreciation for diversity in self and others. Addresses issues of power, inequality, privilege and resulting oppression. Analyzes oppression resulting from persistent social, educational, political, religious, economic and legal inequalities. Focuses on the experiences of oppressed groups in the U.S. in order to understand their strengths, needs and responses. Uses a social justice perspective for the study of and practice with oppressed groups. Required direct practice core curriculum course.

SLWK 604. Social Work Practice with Individuals, Families and Groups I. 3 Hours.
Semester course; 3 lecture hours. 3 credit hours. Introduces basic knowledge, skills and values necessary to provide a range of restorative, rehabilitative, maintenance and enhancement services in social work practice with individuals, families and groups. Introduces selected practice theories and models to guide intervention. Emphasizes the multidimensional and diverse contexts in which problems and needs are assessed and in which intervention occurs. Required direct practice core curriculum course.

SLWK 605. Social Work Practice with Individuals, Families and Groups II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 604 with minimum grade of C. Extends application of beginning knowledge and skills to the phases of intervention with groups and families. Presents knowledge and skills of environmental intervention and termination. Introduces additional selected theories and models for social work practice with individuals, families and groups with attention to special populations and practice evaluation. Required direct practice core curriculum course.

SLWK 606. Policy, Community and Organizational Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 602 with minimum grade of C. The second of two foundation courses on social policy, policy practice and practice in communities and organizations. Examines values and ethical dilemmas facing professional social workers in organizations, communities and policy-making arenas. Explores legislative/political processes. Develops skills in legislative lobbying, advocacy, design of change strategies and tactics, policy analysis and task group leadership. Emphasizes reciprocal effects of policy on social work practice and implications for social and economic justice.

SLWK 607. Social Work Practice with Individuals, Families and Groups for Advanced-standing Students. 3 Hours.
Semester course; 3 credits. Prerequisite: admission to the advanced standing program. Corequisites: SLWK 608, 611 and 612. Students review approaches, principles, techniques and theories of micro social work practice and human behavior. Emphasis is on commonalties and differences among practice modalities, including differential assessment, intervention and evaluation of outcomes. Course includes weekly field instruction integrating seminar. This course is offered during the summer only. Required advanced standing program core curriculum course.

SLWK 608. Social Work Practice in Organizations and Communities for Advanced-standing Students. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the Advanced Standing Program. Corequisites: SLWK 607, 611 and 612. Presents social work theory and practice focusing on social policy, communities, agencies and interventions in light of principles of social and economic justice. Introduces and analyzes the social work role of policy practitioner with its specific skills and tasks. Demonstrates the importance of understanding the community and the agency in social work practice. Provides skill building in advocacy, planned change, and policy and organizational analysis, as well as weekly field instruction seminar. This course is offered during the summer only.

SLWK 609. Foundations of Research in Social Work Practice. 3 Hours.
Semester course; 3 credits. Introduces the methods of social work research, including problem formulation, research designs, measurement, data collection and sampling. Focuses on the application of critical-thinking skills, diversity and research methods of clinical social work practice effectiveness. Covers evaluation of social work programs and services. Required direct practice core curriculum course.

SLWK 610. Human Behavior in the Social Environment II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 601 minimum grade of C. Covers the life course from conception through late adulthood and/or death. Focuses on the influences of biological, psychological, spiritual, economic, political and sociocultural forces on individual and family coping and adaptation. Provides a multidimensional, multicultural perspective on the behavior of individuals and families based on theory and research with identification of the risk and protective mechanisms that influence development. Required core curriculum course.

SLWK 611. Social Work Research for Advanced-standing Students. 3 Hours.
Semester course; 3 credits. Prerequisite: admission to the advanced standing program. Corequisites: SLWK 607, 608 and 612. Reviews approaches to scientific inquiry in the development of knowledge for social work practice; problem formulation; concepts and operational definitions; measurement validity and reliability; selected social work research designs; planned data collection strategies and procedures. Required advanced standing program core curriculum course.

SLWK 612. Advanced-standing Field Instruction. 3 Hours.
Summer course; 3 lecture hours (four eight-hour days in field instruction, followed by two days per week for nine weeks and completed with a full five-day week at the field instruction agency). 3 credits. Corequisites: SLWK 607, 608 and 611. Enrollment restricted to students admitted to the advanced standing program. Reviews foundation-level knowledge, attitudes and skills acquired through social work education at the undergraduate level. Requires application, refinement and the active use of content from the advanced standing curriculum in supervised social work practice in a social agency.

SLWK 692. Independent Study. 1-6 Hours.
Semester course; 1-6 credits. Maybe be repeated for credit. Prerequisites: M.S.W. foundation standing and permission of instructor and M.S.W. program director. The student will be required to submit a proposal for study in an identified practice area or for exploration of a specific problem in social work not ordinarily included in the Master of Social Work curriculum. The results of the student's study will be presented in a format determined by the instructor and student to be most effective for assessing study educational objectives/competencies and outcomes. A maximum of four independent study courses may be included in a student's educational program.

SLWK 693. Foundation Field Instruction I. 3 Hours.
Semester course; 3 field experience hours. 3 credits. Students meet two days/14 hours per week. Provides opportunities to master essential social work knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes integration of content from all areas of the foundation curriculum.

SLWK 694. Foundation Field Instruction II. 3 Hours.
Semester course; 3 field experience hours. 3 credits. Prerequisite: SLWK 693 with minimum grade of C. Students meet two days/14 hours per week. Provides opportunities to master essential social work knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes integration of content from all areas of the foundation curriculum.

SLWK 695. Block Foundation Field Instruction. 6 Hours.
Semester course; 6 field experience hours. 6 credits. Prerequisite: SLWK 605 with minimum grade of C. Students meet five days a week, 35 hours per week, for one semester. Option for part-time students only. Provides opportunities to master essential social work knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes the integration of content from all areas of the foundation curriculum.

SLWK 703. Mental, Emotional and Behavioral Disorders. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. This course reviews the epidemiology, etiology, classification (using the Diagnostic and Statistical Manual of Mental Disorders V) and course of a range of mental, emotional and behavioral disorders and conditions across the life span and the relevance of this knowledge to social work across practice settings. It emphasizes a biopsychosocialspiritual assessment, a risk and protective factors framework, a critical analysis of existing and emerging theory, the impact of difference and diversity, an appreciation of the lived experience of these challenges for clients and their families, and the practical implications of this knowledge for relationship-building and treatment planning as well as interdisciplinary collaboration. Introduces knowledge of psychopharmacology. Required advanced clinical core curriculum course.

SLWK 704. Clinical Social Work Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Provides a multitheoretical orientation to intervention across fields of practice with individuals, families, couples and groups. Emphasizes contemporary psychodynamic and cognitive behavioral approaches and their empirical support. Focuses on multidimensional assessment and the differential application of therapeutic, supportive, educational and resource-management strategies to complex problems of children, youth and adults. Required advanced clinical core curriculum course.

SLWK 705. Clinical Social Work Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 704 with minimum grade of C. Continues a multitheoretical orientation to intervention across fields of practice with emphasis on integrated family systems theory and multidimensional family assessment. Focuses on differential application of psychodynamic, cognitive-behavioral and family systems theories to a range of complex client problems and concerns with attention to diverse populations. Introduces basic knowledge of pharmacology related to social work intervention. Required advanced clinical core curriculum course.

SLWK 706. Research for Clinical Social Work Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Review of statistical inference and decision-making using univariate and bivariate techniques. Introduction to computer applications for quantitative data and methods of analysis of qualitative data. Application of ethical standards for research involving human participants. Further development of critical-thinking skills in using empirical literature. Required advanced clinical core curriculum course.

SLWK 707. Research for Clinical Social Work Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 706 with minimum grade of C. Further development of critical-thinking skills for translating research findings into practice principles and measuring outcomes of clinical practice. Focus on data collection, data analysis, presentation of visual and statistical techniques for qualitative and quantitative research methods, and utilization of findings for improving clinical social work practice. Continued application of statistical inference, integration of empirical research findings and decision-making. Required advanced clinical core curriculum course.

SLWK 710. Concentration Social Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Focuses on advanced policy analysis through an in-depth, focused examination of a particular social policy area or population. Extends basic knowledge and skills of policy formulation, development and impact analysis/evaluation, as these affect practice on behalf of clients. Examines diversity of policy sources; value, political and economic determinants; policy formulation processes; the policy basis for current services; a broad range of potential need domains; and current programs and laws. Integrates knowledge of human behavior and the social environment relevant to the focal policy areas and pays special attention to issues of social and economic justice. Examines current policy issues, advocacy efforts related to these issues and practice strategies for effecting change.

SLWK 711. Strategies for Social Work Planning and Administrative Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Develops leadership and planning skills that guide the implementation of policy and practice in community and organizational settings. Present problem-solving strategies for planning, administration and management of community and organizational resources. Emphasizes planning context for diverse settings. Provides knowledge and skill for human and fiscal resource responsibilities, including fund raising. Examines ethical and justice implications of planning and administrative practice.

SLWK 712. Social Work Planning and Administrative Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Pre- or co-requisites: SLWK 711 and SLWK 714. Presents knowledge and skills for social work leadership in administering, developing and advocating social service policies and programs that are socially and economically just. Examines underlying assumptions, political, value and ethical considerations in social service planning. Presents knowledge of organizational theories and analyzes the political context of problem solving in the internal and external environments of organizations and programs. Focuses on community and organizational planning theories and models of intervention in assessing needs, analyzing problems, determining feasibility and identifying emergent dilemmas. Emphasizes development of critical thinking and self-awareness about role responsibilities and ethical positions for organizational and community leadership at local, state, national and international levels.

SLWK 713. Social Work Planning and Administrative Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 712 with minimum grade of C. Continues development of knowledge and skills begun in prerequisite course. Examines traditional and alternative strategies in formulating proposals to address human needs. Emphasizes multiple program designs (e.g., direct service, advocacy, staff development and training, and community empowerment programs). Incorporates understandings of policies, community, and organizational behavior and change, and leadership styles and skills. Analyzes feasibility of interorganizational partnerships and community relationships. Focuses on financial and human resource acquisition and mobilization, monitoring, accountability and evaluation.

SLWK 714. Research for Social Work Administration, Planning and Policy Practice I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Focuses on social work program and service evaluation including needs assessment, social indicators analysis, evidence-based practices, formative and summative evaluation designs using multiple method data collection and participatory approaches. Review of statistical inference and decision-making, introduction to computer applications for quantitative data and methods for analysis of qualitative data. Application of ethical standards for evaluation involving human participants.

SLWK 715. Research for Social Work Administration, Planning and Policy Practice II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 714 with minimum grade of C. Focuses on evaluation of social work programs and services including data collection, data analysis, presentation of visual and statistical techniques for qualitative and quantitative evaluation methods, and dissemination of evaluation findings. Continues review of statistical inference and decision-making. Emphasizes integrating evaluation findings into a knowledge base for social work administration, planning and policy practice using participatory approaches with stakeholders.

SLWK 716. Concentration Social Policy for Social Work Administration, Planning and Policy Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. Extends SLWK 602 through 606 content on policy practice, organizations, communities and advocacy. Critically analyzes traditional and alternative theories and models of the policy-making process. Demonstrates how the policy process is the core principle for decision-making in agencies, communities and legislatures. Develops advanced skills in policy analysis, policy formulation and place practice including advocacy. Emphasizes the relationship and impact of economic policies on clients, communities and agencies in light of principles of social and economic justice. Analyzes current regulatory and agency policies and their implications for policy practice/advocacy for effecting change.

SLWK 717. Social Work Practice in the School Setting. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Emphasizes knowledge and skills of school social work practice with diverse populations in urban and rural school settings. Uses an ecological explanatory theoretical perspective to conceptualize the interdependence of school, family and community as complex interdependent systems that guide evidence-based practice interventions. Integrates a strengths-based social justice perspective for school-based concerns related to violence, racism, sexism, poverty and their impact on children and youth in educational settings. Advanced clinical elective and core curriculum course for school social work practice certification.

SLWK 718. Social Work Practice in Child Welfare. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Identifies the major social, demographic and economic changes in child welfare services that impact children -- a vulnerable population -- and their families. Builds on explanatory theories and related skill sets required for effective service delivery. Primary service areas are intervention, family preservation, child protection and permanency planning. Advanced clinical elective course.

SLWK 719. Gender and Substance Abuse: Social Work Practice Issues. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Based on the social work person-in-environment explanatory multitheoretical perspective and current research to provide a multidimensional understanding of the influence of gender roles and biological sex in vulnerability to substance abuse and related problems. Evidence-based theory approaches are utilized to identify and address the effects of substance abuse and related problems for men, women and children. Advanced clinical elective course.

SLWK 726. Social Work Practice and Health Care. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Focuses on social work practice in a variety of health care settings with a range of explanatory theories conceptualizing health care issues and identifies related interventions from prevention and health promotion to end-of-life care. Explores ethical and legal issues and introduces frameworks for addressing ethical dilemmas. Examines the role of the social worker on an interdisciplinary team. Examines the influence of economics, political decisions, technology, changing demographics and cultural, social and spiritual/religious experiences on individual health care decisions, access to health care and definitions of health and illness. Advanced clinical elective course.

SLWK 727. Trauma and Social Work Practice: Theory, Assessment and Intervention. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Provides advanced explanatory theoretical knowledge and skills to explain, identify, assess and provide effective and competent evidence-based trauma intervention services to survivors of complex traumatic experiences. Focuses on the evidence-based biopsychosocial consequences of childhood sexual and physical abuse and military/war trauma experiences in daily functioning on individuals, families and groups. Advanced clinical elective course.

SLWK 728. The Interdisciplinary Team in Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. Explores definitions and analyzes interdisciplinary team approaches. Studies the roles and functions of participants on interdisciplinary teams. Emphasizes similarities and differences between social work and other disciplines as members of teams. Explores opportunities for, and obstacles to, effective service delivery by teams.

SLWK 739. Social Work and the Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612.Overview of fundamental principles of Anglo-American law; structure and function of the legal system and its professional membership; lawyers and their working relationship with social workers. Emphasizes client-centered problems encountered in the legal community and the role social workers can play in helping clients deal with those encounters. Explores issues relative to client needs such as welfare rights, consumer protection, mental health treatment, family-related law and discrimination relative to education, housing, employment, health care. Discusses legal issues confronting social work, such as confidentiality, licensing, advocacy and witnessing.

SLWK 740. Social Work Crisis Intervention and Planned Short-term Treatment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. Examines explanatory conceptual and theoretical aspects of the differential use of crisis intervention and planned short-term social work intervention. Explores evidence-based crisis models that guide direct interventions, consultation, collaboration and service-delivery issues. Advanced clinical elective course.

SLWK 741. Social Work Practice and the Neurosciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. The course introduces the social work student to the increasingly important field of neuroscience and the numerous explanatory theories which underlie this science (e.g. neuroplasticity, epigenetics, neurodevelopmental view of trauma, pharmacogenomics, neurobiology of addiction). Focus is placed on why neuroscience research is important for the discipline of social work and how specific neuroscience findings can be utilized by the social work practitioner to enhance practice interventions. Though the field of neuroscience is extensive, this course will focus on several areas that are of particular relevance to social work practice.

SLWK 742. Core Concepts of Child and Adolescent Trauma. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. This course will introduce students to the core concepts (explanatory theory and foundational knowledge) that inform evidence-based assessment and intervention with traumatized children and adolescents. Strength-based practice will be highlighted along with a focus on the identification of protective and promotive factors that foster resiliency and post-traumatic growth. Trauma is broadly defined, and subjects include children and adolescents exposed to traumatic events including, but not limited to natural disasters, war, abuse and neglect, medical trauma, and witnessing interpersonal crime (e.g. domestic violence) and other traumatic events. The course will highlight the role of development, culture and empirical evidence in trauma-specific interventions with children, adolescents and their families. It will address the level of functioning of primary caregiving environments and assess the capacity of the community to facilitate restorative processes.

SLWK 743. Spirituality and Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Designed to educate students for advanced social work practice with persons of diverse religious and nonreligious perspectives of spirituality. It provides a comprehensive introduction to spiritually sensitive social work and is intended to expand the explanatory theories that inform professional social work practice. The concepts of person-in-environment and strengths become vivid as the student in practicum assesses how individuals may use spirituality to establish meaning and purpose in relation to their goals of daily living.

SLWK 744. The Dynamics of the Social Worker/Client Relationship. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: SLWK 612, SLWK 694 or SLWK 695. Enrollment restricted to students in a field placement or work setting in in which they are currently delivering clinical services directly to clients. The effectiveness of all types of direct social work practice depends at least in part on the nature of the relationship between the social worker and client. This course examines in depth the many forms that such relationships can take in the context of various theories, models and strategies common to social work practice. The course reviews the positions of those theories and models with respect to the relationship with an in-depth focus on the processes of relationship development and sustainment and the complex interpersonal dynamics that can arise depending on how the social worker and client experience each other.

SLWK 745. Social Work Practice in Community Mental Health. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Provides the specialized knowledge, values and skills requisite in community mental health settings. Builds on the explanatory biopsychosocial model of mental health/illness. Focuses on current evidence-based psychotherapeutic, psychoeducational, and skill-training models and approaches used with individuals, families and groups experiencing or affected by a range of mental health problems. Examines interdisciplinary teamwork, case management, advocacy and medication management roles. Advanced clinical elective course.

SLWK 746. Social Work Practice and Psychopharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Reviews the historical, political and ethical context of psychotropic medications in social work practice. Provides an explanatory theoretical overview of psychopharmacology and social work roles and skill sets in medication management for effective collaboration with clients, families and other mental health practitioners on medication-related issues. Advanced clinical elective course.

SLWK 747. Social Work Intervention with Children and Adolescents. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Provides students with the opportunity for concentrated study and application of a range of specific explanatory theoretical models and evidence-based intervention strategies with children, adolescents and their families. Special attention is given to multicultural theoretical approaches that guide approaches to providing services to children and adolescents from diverse racial, ethnic, social and sexual orientation backgrounds and diverse settings. Advanced clinical elective course.

SLWK 748. Group Methods in Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Presents several conceptual models of therapeutic groups that explain group dynamics and processes, including evidence-based treatment, educational and mutual aid/self-help. Covers agency conditions affecting practice with groups, the planning of new groups, the multiple phases of group process, and related theory-based interventions and techniques of work with groups and group practice evaluation. Advanced clinical elective course.

SLWK 749. Social Work Intervention in Substance Abuse. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Provides students with the physiological, emotional and behavioral manifestations of substance abuse, DSM-IV-TR-based assessment, a range of relevant evidence-based intervention strategies and the role of social workers in evaluation and intervention. Covers explanatory theory models that guide substance abuse intervention and presents screening, assessment and interventional techniques. Current research and controversies in the field are also emphasized. Advanced clinical elective course.

SLWK 750. Ethics and Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. Examines the history and development of the values base and ethical principles of the social work profession. Investigates codes of ethics for professional practice, with special attention to the principles of human relationships, integrity, social justice and competence. Analyzes ethical dilemmas in social work practice. Considers mechanisms for the enforcement of ethical codes.

SLWK 751. Social Work Practice and AIDS. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 694; or SLWK 612. . Focuses on information, knowledge and skills needed to provide social work services to persons with ARC and AIDS and their families. Emphasizes epidemiological material, psychological and psychosocial aspects of AIDS and ARC for understanding the context of social policies and social work intervention. Addresses differential application of social work roles and functions.

SLWK 753. Social Work Practice with Oppressed Racial and Ethnic Groups. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. Focuses on enhancing the student's micro and macro social work interventions with oppressed racial and ethnic groups. Addresses the social and economic context in which social work practice occurs. Examines history, ethics, values, attitudes and behaviors of the student and the profession as they relate to assessment and intervention with oppressed racial and ethnic groups. Assesses intervention frameworks and techniques for their appropriateness and effectiveness with these groups.

SLWK 755. Social Work Practice in Organizing for Social Change. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. An advanced practice course that recognizes the central role of social action in social work practice, no matter the context, and the value of social justice, no matter what client population. Built on the idea of multiple perspectives and using the Rothman model of organizing, it assumes students already possess basic policy practice and direct practice skills in order to focus on the dimensions of social action and locality development.

SLWK 757. Special Topics in Clinical Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 703 and 704. Provides knowledge and skills for intervention across fields of practice with the use of up to three clinical practice theories or intervention modalities that are not emphasized in required clinical practice courses. Focuses on the differential application of intervention strategies to problems of children, youth and adults. Examines the impact of diversity in clinical practice.

SLWK 759. Art Therapy in Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Focuses on explanatory theory supporting art therapy as an evidence-based approach to clinical social work intervention. Explores the models, principles and techniques of art therapy in social work practice. Examines assessment, intervention, termination and evaluation strategies that supplement traditional social work treatment, including research and specific evidence-based practice strategies for individuals, families, groups and diverse populations.

SLWK 761. Interpersonal Violence. 3 Hours.
Semester course; 3 lecture hours (hybrid course with both in-class and online sessions). 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Increases understanding of interpersonal violence explanatory theory and practice knowledge for a wide range of client systems throughout the lifespan. Included are prenatal exposure to interpersonal violence, child abuse and neglect, teen dating violence, intimate partner violence, children's experience with intimate partner violence, and elder abuse. Victim and perpetrator experiences related to interpersonal violence will be highlighted. Resiliency and experiences of diverse populations from an evidence-based person-in-environment theoretical perspective are emphasized. Prevention theory strategies and relevant interpersonal violence policy issues are also addressed.

SLWK 765. Supervision. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. . Explores task components and responsibilities in supervision of the social worker. Emphasizes a conceptual framework for supervision, including knowledge base, methods and skill in supervision. Attention to affirmative action programs in social service delivery systems.

SLWK 769. Women's Issues and Social Work Practice. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 and 694; or SLWK 695; or SLWK 612. . Explores new perspectives on women and their changing roles as these affect social work practice; direct and indirect ways sexist attitudes are acquired and conveyed; effects of changing female roles of human behavior theory and its application, development of new life styles; social work theories and their relevance to today's world; current women's issues; and the social worker's role as counselor and advocate.

SLWK 770. International Social Work Study Abroad. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. International study. Examines social work clinical and policy practice, social pedagogy and the social welfare system of another country that includes a field trip to the country. Examines a range of issues pertaining to the country, including: society, culture and history; social work education; the social welfare system; selected social programs; social work clinical and policy practice; and comparisons of these topics between the country and the U.S. Requires completion of several course units before the study abroad program.

SLWK 773. Program Evaluation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite(s): SLWK 693 or 694; or SLWK 695; or SLWK 612. . Presents methods, problems and research findings related to the evaluation of social welfare programs. Examines research design options and methodologies available for program evaluation. Explores organizational and administrative contexts in which evaluation activities are initiated, supported, disseminated and utilized. Presents data processing and the roles of data analysis and the computer in the evaluation of social welfare programs.

SLWK 791. Topical Seminar. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with minimum grade of C. Presents and analyzes current social work practice theories and/or issues in specialized areas of interest to social work. Advanced clinical curriculum elective course.

SLWK 792. Independent Study. 1-6 Hours.
Semester course; 1-6 lecture hours. 1-6 credits. Prerequisites: SLWK 693 and 694, or SLWK 695, or SLWK 612, each with a minimum grade of C. The student is required to submit a proposal, guided by theory, for investigation in an identified practice area or problem in social work not ordinarily included in the regular M.S.W. curriculum. The topic is proposed by the student; the number of credit hours is determined by the instructor and approved by the M.S.W. program director. The results of the study are presented in a format determined by the instructor and student and approved by the M.S.W. program director. Concentration year elective course.

SLWK 793. Concentration Field Instruction I. 3 Hours.
Semester course; 3 field experience hours. 3 credits. Students spend 21 hours per week in the field. First of a two-course sequence that provides opportunities to master advanced social work application of theory knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of two-course sequence requires 600 structured field hours. Practicum supervisor has LCSW credentials or clinical course of study M.S.W. with three years post-M.S.W. clinical experience.

SLWK 794. Concentration Field Instruction II. 3 Hours.
Semester course; 3 field experience hours. 3 credits. Prerequisite: SLWK 793 with minimum grade of C. Students spend 21 hours per week in the field. Second of a two-course sequence provides opportunities to master advanced social work application of theory knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of two-course sequence requires 600 structured field hours. Practicum supervisor has LCSW credentials or clinical course of study M.S.W. with three years post-M.S.W. clinical experience.

SLWK 795. Concentration Block Field Instruction. 6 Hours.
Semester course; 6 field experience hours. 6 credits. Prerequisite: SLWK 705 with a minimum grade of C. Students meet five days a week for 40 hours per week for one semester. Advanced block field instruction (option for part-time students). Provides opportunities to master advanced social work knowledge, values and skills through practice under the direction of an agency-based field instructor, monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of course requires 600 structured field hours.

SLWK 796. Concentration Field Instruction DE I. 2 Hours.
Semester course; 2 field experience hours. 2 credits. Pre- or corequisites: SLWK 703, 704-705, 706-707, 710 and electives; or SLWK 710 , 711, 712-713, 714 -715 and electives; or foundation curriculum; or permission of the instructor and M.S.W. program director. Enrollment restricted to students with M.S.W. concentration standing in the distance education program. Students will spend 15 hours per week in the field. Course provides opportunities to master advanced social work application of theory knowledge, values and skills through practice under the direction of an agency-based field instructor and monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of course requires 200 structured field hours.

SLWK 797. Concentration Field Instruction DE II. 2 Hours.
Semester course; 2 field experience hours. 2 credits. Prerequisite: SLWK 796 with minimum grade of C. Pre- or corequisites: SLWK 703, 704-705, 706-707, 710 and electives; or SLWK 710 , 711, 712-713, 714 -715 and electives; or foundation curriculum; or permission of the instructor and M.S.W. program director. Enrollment restricted to students with M.S.W. concentration standing in the distance education program. Students will spend 15 hours per week in the field. Course provides opportunities to master advanced social work application of theory knowledge, values and skills through practice under the direction of an agency-based field instructor and monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of course requires 200 structured field hours.

SLWK 798. Concentration Field Instruction DE III. 2 Hours.
Semester course; 2 field experience hours. 2 credits. Prerequisite: SLWK 797 with a minimum grade of C. Pre- or corequisites: SLWK 703, 704-705, 706-707, 710 and electives; or SLWK 710 , 711, 712-713, 714 -715 and electives; or foundation curriculum; or permission of the instructor and M.S.W. program director. Enrollment restricted to students with M.S.W. concentration standing in the distance education program. Students will spend 15 hours per week in the field. Course provides opportunities to master advanced social work application of theory knowledge, values and skills through practice under the direction of an agency-based field instructor and monitored by a faculty field liaison. Emphasizes integration of content from all areas of the concentration curriculum. Completion of course requires 200 structured field hours.

Social Work – Doctorate (SWKD)

SWKD 701. Quantitative Research Methods. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with master's-level course work in research methods and introduction to statistics, graduate standing in social work or permission of program director. Focused on concentrated study of principles of the quantitative, scientific method for knowledge building, and practice- and policy-related research. Special emphasis on the different stages of research methods, including problem formulation, sampling, measurement, design and data collection within the context of professional values, ethics and commitment to social justice.

SWKD 702. Quantitative Data Analysis. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Enrollment is restricted to students with master's-level course work in research methods and introduction to statistics, graduate standing in social work or permission of program director. A required foundation course in a sequence focused on concentrated study of principles of quantitative scientific method for knowledge-building and practice- and policy-related research. Special emphasis on the application of descriptive and inferential statistical techniques within the context of applied social work research.

SWKD 703. Philosophical Issues in Social Work Knowledge Building. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to Ph.D. program in social work or permission of program director. This seminar focuses on assisting seminar participants to develop and refine their understanding of the logical foundations and the underlying meta-framework for modes of inquiry in science. Of particular focus will be the social sciences including social work. Using a paradigm perspective, the seminar will investigate the epistemological, ontological and methodological implications for knowledge building for social work.

SWKD 704. Multiparadigmatic Qualitative Methods and Analysis. 4 Hours.
Semester course; 4 lecture hours. 4 credits. Focuses on assisting participants to develop and refine their understanding of and skills in qualitative research from multiple paradigmatic perspectives. The course will investigate a variety of qualitative strategies that allow for examination, exploration and/or description of phenomena by theory building, theory testing or constructing meaning. Emphasis will be on a range of qualitative methods for collecting empirical material and methods for the analysis of those data, including decisions about the use of computer analysis.

SWKD 705. Multivariate Analysis in Social Work and Human Services Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: master's-level course work in research methods and introduction to statistics, graduate standing in social work or permission of program director, and SWKD 701 and 702. The third of a three-semester course sequence focused on concentrated study of principles of the quantitative, scientific method for knowledge building and practice- and policy-related research. Special emphasis on the application and interpretation of multivariate statistical techniques within the context of applied social work research.

SWKD 708. Social Science Foundations for Social Work. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: admission to the Ph.D. program in social work or permission of program director. This doctoral seminar focuses on theories and conceptual approaches used as the knowledge base for social work practice. Emphasis will be given to developing the abilities of students to identify the essential elements of theory, determining the knowledge building purposes of theory and articulating the rationale for selection of theories as a basis and guide for scholarly inquiry. In addition, theories are officially evaluated for their implicit assumptions, values, empirical support and potential usefulness for students' own specialized area of study. Classic and contemporary theories covered will be drawn from the social sciences with an emphasis on those appropriate for the social change and social justice concerns of social work.

SWKD 710. Social Work, Social Welfare and Social Thought. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: doctoral program admission or permission of instructor. Required seminar for social work doctoral students. Examination of social work, its roles and functions in relation to contemporary social problems, social policy and social work practice interventions that provide solutions to these problems. Analysis of issues of social welfare and the social work profession relating to structure, functions and history from the perspective of social work values, ethics, professional standards and concern for social justice. Designed to foster a critical perspective on the profession in its environment and provide grounding in the historical and cultural traditions and major streams of social thought influencing the profession, its development and the American system of social welfare.

SWKD 715. Development and Evaluation of Social Work Practice Theories and Models. 3 Hours.
Semester course; 3 lecture hours. 3 credits. A required seminar for second-year doctoral students that builds on behavioral science theory and research methods/data analysis courses. This course offers analytical and comparative perspectives on classic and contemporary theories and models of change that underlie real-world social work practice interventions, services, programs and policies across system sizes, and the research approaches and methods used to evaluate their implementation and impact. Students discover existing practice theories and models of change related to their own substantive interest in solving a pressing social problem or human challenge and propose a new theoretically and empirically grounded change strategy that contributes to the science of social work, including the advancement of social justice and/or an appreciation of diversity.

SWKD 722. Evaluation of Human Service Programs. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Ph.D. program standing or permission of instructor. Application of social research methods to the planning and development of evaluation research in human service programs. Covers the planning and evaluation cycle, categories of evaluation (evaluability assessment, needs assessment, social indicators, asset mapping, process, performance, outcome and impact), roles of evaluators and stakeholders, development and use of program theory, and dissemination of evaluation results for policy and program improvement.

SWKD 724. Constructivist Inquiry. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Ph.D. program standing or permission of program director. The purpose of this course is to: 1) contrast interpretive and functionalist (positivist) inquiry paradigms and note the conditions under which each is the paradigm of choice for research; 2) clarify the relationship between constructivist and qualitative methodologies; 3) acquaint the student with some of the more common constructivist methods and to offer opportunities in applying those methods; 4) prepare the student to act as a peer reviewer or auditor in a constructivist inquiry.

SWKD 726. Seminar on Social Work Education and Teaching. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires Ph.D. program standing or permission of program director. This doctoral seminar prepares students to become effective and ethical social work educators. The course focuses on teaching and learning approaches in higher education, assessment of educational outcomes, curriculum design and course development, roles and responsibilities of faculty members, and historical and contemporary trends in social work education.

SWKD 728. Academic Writing: Effective Writing, Manuscript Preparation and Publication. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students admitted to the Ph.D. program in social work or with permission of the instructor. This course provides the opportunity for doctoral students to enhance and refine the academic writing skills necessary for productive social work scholarship. The course focuses on understanding and mastering the structure, process and elements of high-quality academic writing as well as respectful and helpful reviewing. Students will especially examine scholarly writing in and for journal articles, books, book reviews and doctoral dissertations. Students will be exposed to the literature on the "how tos" of scholarly writing itself and develop their own skills in being a juror/professional reviewer. Special emphasis is placed on the development of an intellectual community in which excellence in written expression is valued. The explicit goal is established that each student should use the course to prepare one or more scholarly products during the course related to her/his/their substantive area.

SWKD 791. Topical Seminar. 3 Hours.
Semester course; 3 lecture hours. 3 credits. May be repeated once for credit. Prerequisite: permission of instructor. Study of the current state of knowledge and research within a specialized area of concern to social policy and social work.

SWKD 792. Independent Study. 1-3 Hours.
Semester course; 1, 2 or 3 credits. Prerequisite: permission of the program director. Independent reading and study in selected areas under the supervision of a member of the faculty. May be repeated for a maximum of 6 credits that count toward the 36 required credits. May then be taken for an additional 1-12 credits to accommodate the need for continuous enrollment required of all students between completion of required course work and passage of the comprehensive examinations.

SWKD 797. Directed Research. 3 Hours.
Semester course; 3 credits. Prerequisite: completion of first-year Ph.D. courses in social work or permission of program director. The course provides doctoral students the opportunity to do hands-on research prior to the dissertation project that is relevant to their substantive area or individual learning needs. The topic and specific project will be initiated by the student and implemented in collaboration with a School of Social Work faculty member. A proposal for a directed research course must be submitted that specifies how the student will gain experience, knowledge and skills in one or more aspects of conducting a research project, including conceptualization of the question; development of a graphic or visual schema; measurement design and/or instrument development; qualitative, quantitative or mixed-methods research design and implementation; data collection or data management; data analysis; and dissemination of findings. Students may create their own project or dovetail with existing student or faculty projects.

SWKD 798. Intergrative Seminar. 1 Hour.
Semester course; 1 seminar hour. 1 credit. This seminar in the final semester of course work is a capstone course designed to highlight and extend the integration of learning, stress the "wholeness" of the doctoral experience and more intentionally embrace the program themes related to integration, critical thinking, and social justice and diversity. The course serves as organizing structure for understanding gaps in one's own knowledge base, practice peer mentoring and leadership in nurturing an intellectual community, and cooperatively plan final aspects of comprehensive exam study. It is seen as one vehicle for understanding the context of the student's line of inquiry and for deepening professional development, identity and career preparation as a social work scholar and leader. Graded as S/U/F.

SWKD 898. Dissertation Research. 1-16 Hours.
Semester course; 1-16 credits. Prerequisite: successful completion of comprehensive examinations or permission of program director. Students are required to complete 16 credit hours. May be taken for additional credits until dissertation is formally accepted.

VCU Life Sciences

Bioinformatics (BNFO)

BNFO 501. Introduction to Physical Implementation of Databases. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: permission of instructor. Basic searching and sorting algorithm design, and advanced data structures including hashing and B-trees.

BNFO 505. Essentials of Statistics in Bioinformatics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: Statistics and permission of instructor. An intensive course designed for graduate students in either the biology/genomics or the computational science tracks of the bioinformatics program, aimed at providing the background in statistical concepts necessary for them to participate in graduate-level courses involving statistics. The course will focus on areas of particular interest in bioinformatics, including probability, combinatorics and linear models.

BNFO 507. Essentials of Molecular Biology in Bioinformatics. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisites: Cell biology and permission of instructor; Pre- or corequisite: Organic chemistry or permission of instructor. An intensive course designed for graduate students in either the quantitative/statistics or the computational science tracks of the bioinformatics program, aimed at providing the background in molecular biology necessary for them to participate in graduate-level courses involving molecular biology. The course will focus on areas of particular interest in bioinformatics, including DNA, RNA and protein synthesis, gene structure, function and regulation, protein structure, activity and regulation, and the tools by which formation in these areas has been discovered.

BNFO 508. Introduction to Bioinformatics Research. 2 Hours.
Semester course; lectures and 3 laboratory hours. 2 credits. Prerequisites: graduate status and permission of instructor. Introduction to all active research programs in bioinformatics. Presentations of research programs by investigators and rotation of students through track-appropriate faculty labs to gain direct exposure to individual research projects. Graded as S/U/F. Required of all first-year students pursuing the thesis option (M.S.).

BNFO 514. Modeling Biocomplexity. 3 Hours.
Semester course; 2.5 lecture and .5 laboratory hours. 3 credits. Prerequisite: one year of calculus. Introduction to the modeling and simulation of the behavior of complex biological systems, including models in both continuous and discrete time. Numerical methods using mathematica, analytical methods using calculus and laboratory experiments using computer interfaces will be used to study population dynamics and the behavior of physiological systems exhibiting such properties as oscillations and chaotic biological dynamics. Crosslisted as: PHYS 514.

BNFO 530. Bioinformatics and Genomics in Drug Research. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Covers the basic elements of cellular pathways and drug interactions, and how modern genomics comes into play. Presents bioinformatics principles being used every day in data-intensive fields of research. Introductory and concept-oriented, the course will prepare students for grasping how bioinformatics is being used in many areas of biomedical sciences. Geared toward students coming from a variety of backgrounds in biology, biochemistry and chemistry. While many of the analytical approaches are statistical in nature, there is no requirement for a background in statistics or mathematics. Each student will have the opportunity to design a small project applying bioinformatics concepts. Crosslisted as: MEDC 530.

BNFO 540. Fundamentals of Molecular Genetics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOL 310 or consent of instructor. The basic principles and methodologies of molecular biology and genetics are applied to genome organization, replication, expression, regulation, mutation and reorganization. Emphasis will be placed on a broad introduction to and integration of important topics in prokaryotic and eukaryotic systems. Crosslisted as: BIOL 540.

BNFO 541. Laboratory in Molecular Genetics. 2 Hours.
Semester course; 1 lecture and 4 laboratory hours. 2 credits. Pre- or corequisite: BIOL 540 or equivalent. Experiments are designed to apply advanced techniques and concepts of molecular biology and genetics using prokaryotic and eukaryotic systems. Emphasis will be placed on experimental design, integrating results throughout the semester, making use of relevant published literature, scientific writing and providing hands-on experience with advanced equipment and methodologies. Crosslisted as: BIOL 541.

BNFO 591. Special Topics in Bioinformatics. 1-4 Hours.
Semester course; variable lecture hours. 1-4 credits. Adviser's approval is required for counting each special topics course toward meeting specific requirements of the master's program. An introductory, detailed study of a selected topic in bioinformatics unavailable as an existing VCU course. If multiple topics are offered, students may elect to take more than one. Graded as "S," "U" or "F." Students will find specific topics and prerequisites for each special topics course listed in the Schedule of Classes.

BNFO 592. Independent Study. 1-9 Hours.
Semester course; variable lecture hours. Variable credits. Determination of the amount of credit and permission of instructor, adviser and curriculum committee must be obtained prior to registration for this course. Designed to provide an opportunity for independent study at an introductory graduate level in a bioinformatics-related area of interest and significance to the student outside what is available through the courses and other options in the Bioinformatics Program. Graded as "S," "U" or "F.

BNFO 600. Basic Scripting Languages. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: permission of instructor. Basics of programming in PERL or other appropriate scripting language.

BNFO 601. Integrated Bioinformatics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: permission of instructor. Presents major concepts in bioinformatics through a series of real-life problems to be solved by students. Problems addressed will include but not be limited to issues in genomic analysis, statistical analysis and modeling of complex biological phenomena. Emphasis will be placed on attaining a deep understanding of a few widely used tools of bioinformatics. Crosslisted as: BIOL 601.

BNFO 620. Bioinformatics Practicum. 3 Hours.
Semester course; 3 lecture hours. 3 credits. BNFO 601/BIOL 601 or permission of instructor. Practical application of bioinformatics to genomic, proteomic and pharmacogenomic analyses. Students will work in small groups to plan, develop and execute a project designed to solve practical challenges in the realm of bioinformatics. Proficiency in various aspects of bioinformatics will be developed.

BNFO 621. Business and Entrepreneurship Essentials for Life Scientists. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Consists of presentations on the core concepts of business, including intellectual property, patents and patent law, entrepreneurship, launching a "start up," raising capital, financial management, marketing, managerial accounting, planning, and project management. Course includes lectures and discussions on core concepts of business and their real-world application. Students will develop a business plan and/or a plan to manage a research project. Business case studies and team projects with presentations are required. Focus is on the biotechnology and pharmaceutical industries.

BNFO 637. Networks Biology. 3 Hours.
Semester course; 2.5 lecture hours. 3 credits. Prerequisite: prior course work in cell biology or molecular biology, or permission of instructor. Covers in detail networks as a basic tool for the systems biology approach to biology and medicine, particularly on the molecular level. Qualitative and quantitative aspects of biological systems and processes will be identified and analyzed. The course focuses on the biochemical networks formed in the cell from genes, proteins and metabolites. Network structure and dynamics will be characterized proceeding from graph theory and other mathematical methods. Essential part of the course is the practical work with basic software for building, manipulation and analysis of biological networks, as well as for identifying structural motifs and modules, and comparative network organisms (human, drosphila, yeast, C. elegans).

BNFO 650. Sequence Analysis in Biological Systems. 3 Hours.
Semester course; 1 lecture and 2 laboratory hours. 3 credits. Prerequisite: BNFO 601/BIOL 601 or permission of instructor. This course will treat the computational theory behind algorithms that are used for nucleic acid and protein sequence analysis. Students will be exposed to the theory and methodology of computational biology that has led to the development of current sequence analysis software. The objective of the course is to provide students with a basic knowledge of how current software tools have been developed and how they function, which will permit them to then apply this knowledge to the development of new algorithms and technology.

BNFO 653. Advanced Molecular Genetics: Bioinformatics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Cell/molecular biology or permission of instructor. An advanced course on contemporary bioinformatics. Topics covered include the principles and practice of DNA, RNA and protein sequence analysis, computational chemistry and molecular modeling, expression array analysis and pharmacogenomics. The course includes lectures, reading, computer lab, homework problem sets and projects. Crosslisted as: MICR 653.

BNFO 690. Seminars in Bioinformatics. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Presentation and discussion of research topics of current interest in the field of bioinformatics. Graded as "S," "U" or "F.

BNFO 691. Special Topics in Bioinformatics. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Adviser's approval is required for counting each special topics course toward meeting specific requirements of the master's program. An advanced, detailed study of a selected topic in bioinformatics unavailable as an existing VCU course. If multiple topics are offered, students may elect to take more than one. Students will find specific topics and prerequisites for each special topics course listed in the Schedule of Classes.

BNFO 692. Independent Study. 1-9 Hours.
Semester course; variable hours. Variable credit. Determination of the amount of credit and permission of the instructor, adviser and curriculum committee must be obtained prior to registration for this course. A course designed to provide an opportunity for independent study in a bioinformatics-related area of interest and significance to the student outside what is available through the courses and other options in the Bioinformatics Program.

BNFO 697. Directed Research in Bioinformatics. 1-9 Hours.
Semester course; variable hours. 1-9 credits. May be repeated for credit. Directed research leading to the M.S. degree in bioinformatics. Graded as S/U/F.

BNFO 700. Externship in Bioinformatics. 1,2 Hour.
Semester course; variable hours. 1 or 2 credits. Prerequisites: BNFO 601/BIOL 601 and BNFO 620, or permission of instructor. Typically off-campus planned experiences for advanced graduate students designed to extend professional competencies, carried out in a professional setting under supervision of an approved professional. Externship activities monitored and evaluated by university faculty. Plan of experience designed by extern and external adviser with prior approval of department. An externship class will meet weekly using online technology to accommodate students doing out-of-town summer externships. Each externship will be a defined project leading to a required final report or product and offering real potential benefits to the sponsoring company/lab. Subsequent to the externship, a presentation to program faculty and students is required.

Environmental Studies (ENVS)

ENVS 515. Tropical Field Ecology. 4 Hours.
Semester course; 3 lecture and 3 laboratory hours. 4 credits. Study abroad at a tropical location. This course provides students with an immersive study of tropical ecology and conservation through a unique blend of rigorous science and community engagement. While studying abroad, students learn about tropical ecosystems by collecting data on both organisms and their habitats and by reading and discussing scientific papers. Students also engage with local conservation organizations leading efforts to protect habitats. Progress and research findings are intended to be presented in a symposium format. See the Schedule of Classes for specific regions and topics.

ENVS 521. Introduction to Geographic Information Systems. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. An introduction to creating and using geographically referenced databases for urban and environmental analysis and planning. Includes geographic and remote sensing data structures, global positioning systems, spatial analysis, geographic data standards, public domain software and data resources, and principles of cartography design. Lab exercises in the use of geographic information systems software tools. Crosslisted as: URSP 521.

ENVS 541. Principles of Waste Management. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Design and operation of waste treatment, storage, disposal and control processes will be covered. Design tanks, landfills and incinerators will be discussed in detail. Data acquisition and interpretation methods needed for process control and monitoring will be examined.

ENVS 543. Environmental Data Literacy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students with graduate standing, or those with one course in statistics and permission of instructor. Develop quantitative skills for the visualization, manipulation, analysis and communication of environmental "big data." This course focuses on spatial environmental data analysis, interpretation and communication, using real-time data from the Rice Rivers Center and the R statistical analysis environment.

ENVS 550. Ecological Risk Assessment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: course work in ecology, or permission of instructor. Ecological risk assessment provides an introduction to the concepts and practice of risk assessment as applied to ecological applications, focusing on the United States. The course will examine the history of risk assessment in U.S. environmental regulation and policy, development and practice of ecological risk assessment and application to regional issues. All students will conduct a risk assessment for a regional case study.

ENVS 556. Historical and Cultural Landscapes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Open only to seniors who have completed ANTH 302 or 303 and graduate students with permission of instructor. Students will study historical and contemporary landscapes as the products of the producers of human culture, with particular attention to riverine landscapes. Focus will be on the ways in which humans shape and respond to their ecosystems. Students will participate in an active field research program, including the archaeological recovery and analysis of historical landscapes. Crosslisted as: ANTH 556.

ENVS 590. Research Seminar in Environmental Studies. 1 Hour.
An interdisciplinary examination of problems and issues related to environmental studies.

ENVS 591. Topics in Environmental Studies. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be repeated with different topics for a maximum of 12 credits. An in-depth study of a selected environmental topic. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

ENVS 601. Survey in Environmental Studies. 3 Hours.
Provides a foundational understanding of issues central to environmental studies. Lectures will address the theoretical and scientific basis for a variety of pertinent issues, including: and water quality and quantity, pollution prevention, environmental law and policy, population growth, global climate change, conservation, and human and ecological health.

ENVS 602. Environmental Technology. 1-3 Hours.
This course gives students the opportunity to develop skills not available in the traditional academic setting. Students take two to four workshops offered by the Center for Environmental Studies in its Environmental Technology Training Workshop series. Students will complete an additional project related to each workshop or series of workshops for evaluation purposes.

ENVS 603. Environmental Research Methods. 3 Hours.
Prerequisite: STAT 543 or permission of instructor. Provides students with an understanding of statistical and research methods as they apply to environmental research. Students will complete projects on available data sets. This course emphasizes the application of current data analysis methodologies, including the graphical display of summary data, statistical modeling and prediction, and Geographic Information Systems (GIS).

ENVS 628. Environmental Policy and Administration. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course explores the relationship between environmental policy and its implementation within a democratic political system. It includes an investigation of basic concepts that underlie environmental policy and the difficulties encountered when attempting to apply them in a real-world setting. It also surveys a variety of tools and methodologies that may be useful in attempting to develop and implement environmental policy. Crosslisted as: PADM 628.

ENVS 640. River Policy. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Examines public policy related to rivers and watersheds. Uses the James River for exploring and illustrating generic river policy issues. Crosslisted as: GVPA 640.

ENVS 650. Pesticides, Health and the Environment. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Course work in toxicology, chemistry or permission of instructor. This course is a balanced overview of the benefits and adverse effects of pesticides in the environment and as related to human health. The class provides an interdisciplinary study of pesticide use, fate, exposure, transport and effects.

ENVS 654. Environmental Remote Sensing. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ENVS 602, or permission of the instructor. This course provides a basic and applied understanding on the use of digital remote sensor data to detect, identify and characterize earth resources. Students are required to demonstrate an understanding of the spectral attributes of soils, vegetation and water resources through various labs involving both image- and non-image-based optical spectral data. Crosslisted as: URSP 654/BIOL 654.

ENVS 655. Hydrogeology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Focuses on the fundamental concepts of groundwater flow and contaminant transport with an emphasis toward environmental issues such as waste disposal, surface water hydrology, groundwater hydrology and wells, environmental impacts and hydrogeological systems. Allows students to understand and interpret the basic environmental hydrogeologic characteristics of a site and to use that knowledge to provide an informed opinion on protection and remediation.

ENVS 660. Virginia Environmental Law. 3 Hours.
Semester course; 3 lecture hours. 3 credits. An overview of relevant Virginia environmental law and regulations in the fields of environmental planning, management and policy. Provides students with working knowledge of documentation necessary for compliance with state environmental programs.

ENVS 670. Pollution Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: Course work in: ecology, toxicology or animal physiology; or permission of instructor. Courses provides an in-depth presentation of the physiology of animals in polluted habitats and examines the responses of aquatic organisms exposed to pollutants and other environmental stressors, including: thermal and salinity changes, anoxia and hypoxia, hypercapnia, chemical contamination, sedimentation and microbial contamination. The course takes a comparative approach and focuses on non-human systems. Both laboratory and field experiences are provided.

ENVS 675. Advanced Environmental Applications of GIS. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: ENVS 521 or ENVS 602. The objective of this course is to give students a greater understanding of advanced GIS topics using environmental data. Knowledge gained in this course will give students the tools required to address complex natural resources and environmental issues by providing experience in advanced spatial and geostatistical analysis and environmental modeling. Students will also be exposed to programming, open source tools and interfaces that are used to disseminate large environmental data sets.

ENVS 691. Topics in Environmental Studies. 1-4 Hours.
Semester course; 1-4 lecture hours. 1-4 credits. May be repeated with a different topic for a maximum of 12 credits. Provides an in-depth study of a selected environmental topic. See the Schedule of Classes for specific topics to be offered each semester and prerequisites.

ENVS 692. Independent Study. 1-3 Hours.
Variable hours. 1-3 credits per semester. May be repeated with different topics for a maximum of 6 credits. An in-depth study of a selected environmental topic.

ENVS 693. Internship in Environmental Studies. 1-3 Hours.
Each credit hour represents 60 clock hours of work. Provides students with a workplace experience in a public or private agency related to Environmental Studies.

ENVS 697. Research. 1-3 Hours.
Planning, preparation, completion, and presentation of research in environmental studies.

ENVS 698. Thesis. 1-3 Hours.
Planning, preparation, completion, and presentation of research in environmental studies.

Life Sciences (LFSC)

LFSC 510. Biological Complexity. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisites: physics and calculus, or permission of instructor. Open only to graduate students and qualified seniors. An introduction to the basis of complexity theory and the principles of emergent properties within the context of integrative life sciences. The dynamic interactions among biological, physical and social components of systems are emphasized, ranging from the molecular to ecosystem level. Modeling and simulation methods for investigating biological complexity are illustrated. Crosslisted as: BIOL 545.

LFSC 520. Bioinformatic Technologies. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: BIOL 545/LFSC 510 or permission of instructor. Introduction to the hardware and software used in computational biology, proteomics, genomics, ecoinformatics and other areas of data analysis in the life sciences. The course also will introduce students to data mining, the use of databases, meta-data analysis and techniques to access information. Crosslisted as: BIOL 548.

LFSC 591. Special Topics in Integrative Life Sciences. 1-4 Hours.
Semester course; variable hours. 1-4 credits. A 500-level study of a selected topic in integrative life sciences. Students will find specific topics and prerequisites for each Special Topics course listed in the Schedule of Classes. If multiple topics are offered, students may elect to take more than one.

LFSC 610. Analytical Methods in Biocomplexity Analysis. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: LFSC 510/ BIOL 545 or equivalent, or permission of instructor.
An introduction to mathematical and computational methods in biocomplexity analysis and the mathematical and computational simulation of biological systems. Topics include methods for dynamical systems analysis, nonlinear systems analysis, gene sequencing, fractals and chaos, and pattern recognition. Students will be exposed to Maple, Matlab, SPSS, E-cell, BioPerl, Epigram, and C.

LFSC 630. Integrative Life Sciences Research. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to integrative life sciences doctoral students. An introduction to integrative research in the life sciences from the molecular to ecosystem level. The course will include presentations on ongoing interdisciplinary and systems-oriented life sciences research by faculty members and discussion and analysis of classic interdisciplinary research projects.

LFSC 631. Student Seminar in Integrative Life Sciences. 1 Hour.
Semester course; 1 seminar hour. 1 credit. May be repeated for credit. The ability to present and evaluate independent research across diverse disciplines is imperative to scientists in the life sciences, where collaboration and integrated thinking is essential. This seminar will provide this opportunity from both perspectives with oral informal presentations to a peer graduate student audience, who will provide peer evaluations and critical feedback. Graded as S/U.

LFSC 690. Research Seminar in Integrative Life Sciences. 1 Hour.
Semester course; 1 lecture hour. 1 credit. May be repeated for credit. Presentation and discussion of research topics of current interest in the life sciences. Graded as "S," "U" or "F.

LFSC 691. Special Topics in Integrative Life Sciences. 1-4 Hours.
Semester course; variable hours. 1-4 credits. Prerequisite: Permission of instructor required. Advanced graduate study of a selected topic in integrative life sciences. Students will find specific topics and prerequisites for each Special Topics course listed in the Schedule of Classes. If multiple topics are offered, students may elect to take more than one.

LFSC 697. Directed Research in Integrative Life Sciences. 1-15 Hours.
Semester course; 1-15 research hours. 1-15 credits. May be repeated for credit. Directed research in interdisciplinary and integrative life sciences. Graded as S/U.

da Vinci Center for Innovation

Innovation in Product Design and Development (INNO)

INNO 501. Arts Principles for Product Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Open only to students enrolled in the Master of Product Innovation program or with approval of instructor. Introduces studio-based arts instruction to individuals with a background in business, engineering or other non-arts discipline. Lectures and assignments expose students to a broad range of skills and vocabulary, enabling them to comprehend, analyze and communicate visually. Working individually and in teams, the core experience will be formed through iterative making, via direct, hands-on material experience.

INNO 502. Business Principles for Product Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Open only to students enrolled in the Master of Product Innovation program or with approval of instructor. Introduces business principles and concepts to non-business students. Topics cover the functions and activities organizations engage in to conduct commerce, including planning, marketing, accounting, operations, finance and human resource management. Project management, as used for developing innovative ideas and commercializing new goods and services, is the organizing structure used for integration of concepts.

INNO 503. Technology Principles for Product Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Open only to students enrolled in the Master of Product Innovation program or with approval of instructor. Introduces technology and technological principles to students with non-engineering-related degrees. A particular focus is learning and applying a technology problem-solving process to different types of open-ended problems. The process includes the steps of needs identification, information gathering, idea generation, evaluation and selection.

INNO 590. da Vinci Project. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Open only to students enrolled in the Master of Product Innovation program. Students will engage in an interdisciplinary product innovation project with a corporate sponsor under faculty supervision. Topics and activities will hone product innovation skills, including project management, team building, concept generation and testing, market analysis, visualization, and prototyping.

INNO 600. Integrative Design Studio. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Open only to students enrolled in the Master of Product Innovation program. Integrates the theory and practice of product innovation across the arts, business and engineering disciplines. Students are exposed to and apply a broad set of skills and tools to aid in understanding, envisioning and communicating product innovation. Working in interdisciplinary teams, students will hone teamworking skills and collectively address contemporary issues associated with product innovation, such as sustainability.

INNO 651. Master's Project in Product Innovation I. 6 Hours.
Semester course; 2 lecture and 4 laboratory hours. 6 credits. Prerequisites: two of INNO 501, 502 and 503; and INNO 590 and 600. This capstone experience requires that an interdisciplinary team engage in various facets of a real product development initiative. The project may be company-sponsored or an approved student-originated effort. Applying arts, business and engineering skill sets gained from previous course work, students will identify a potential opportunity and conceive viable product concepts to be pursued across the three project stages of concept generation, concept development and refinement and concept finalization. The semester will culminate with each team producing a set of prototypes and initial business cases for preferable concepts, with at least one viable concept supported by a viable business case an expected class deliverable. Graded as S/U/F.

INNO 652. Master's Project in Product Innovation II. 6 Hours.
Semester course; 2 lecture and 4 laboratory hours. 6 credits. Prerequisite: INNO 651. This is the second course of the capstone experience. An interdisciplinary team will continue engaging in the facets of a company-sponsored or student-originated product development initiative begun in INNO 651. Applying arts, business and engineering skill sets gained from previous course work, students will further develop viable concepts and culminate the capstone experience with the proposal of at least one well-detailed, functional product prototype accompanied by a formal business plan. Students will participate in three project stages: prototype and business case incubation, working prototype and business plan development, and commercialization. Graded as S/U/F.

INNO 691. Topics in Product Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Study of current and emerging topics in the field of product innovation. Topics may vary by semester. See the Schedule of Classes for offerings each semester.

INNO 697. Guided Study in Product Innovation. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: Approval of proposed work is required by the Master of Product Innovation program. Students in the M.P.I. program wishing to do research on problems in the area of product innovation will submit a detailed outline of their problem. They will structure a research study, undertake this study and prepare a written report on the problem.

Office of Research and Innovation

Clinical and Translational Research (CCTR)

CCTR 520. Fundamentals of Research Regulation. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Focuses on the regulations that govern translational and clinical research. There will also be a series of discussions on the influence of international policies and research guidelines on the conduct of research. Topics include, but are not limited to, the history and current role of the FDA and the OHRP within the research arena; informed consent regulations relevant to federally funded research i.e., the common rule; informed consent regulations relevant to investigations conducted in support of a new drug application or an expanded marketing indication; good clinical practice guidelines; international conference on harmonization (ICH) conduction of research guidelines; HIPPA rules and regulations relevant to the conduction of research on human subjects; fiscal accountability/responsibility; and clinical trial registration and results reporting guidelines.

CCTR 630. Design Implications in Clinical Trials. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course focuses on designing intervention studies to achieve research objectives by selecting appropriate study samples, end points and trial designs. Specific topics include efficacy versus effectiveness trials and critiquing clinical trial protocols, with emphasis on evaluating strengths and weaknesses of trial design.

CCTR 631. Adaptive Clinical Trials. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: CCTR 630 or BIOS 571. This course is intended for the research scientist who is interested in advancing innovative trial designs and wishing to incorporate adaptations, modifications and changes to the clinical trial process. The goal is to enhance comprehension and methodologic skills in designing adaptive clinical trials for clinical investigators. The course provides an overview of the theoretical framework and key concepts of adaptive design methods in clinical trials. The design and implementation process are discussed through real-world examples. The feasibility, validity, integrity and efficiency of the trial designs will be stressed through comparisons between traditional fixed and adaptive trials. Graded as pass/fail.

CCTR 640. Team Science: Theories and Practice. 2 Hours.
Semester course; 2 lecture hours. 2 credits. In this seminar-style course, students will keep current by participating in presentations, discussion and writing on the topic of the science of team science. This course is designed to introduce students to research in the social sciences and to help build skills in critical-thinking, leading discussions, writing and providing succinct presentations. Teamwork is difficult and it is pervasive. Whether engaging in collaborative research or collaborating with others within a chosen profession, students will better understand how to be more effective at being team members as well as leading a team. Graded as pass/fail.

CCTR 690. Research Seminar in Clinical and Translational Sciences. 1 Hour.
Semester course; 1 lecture hour. 1 credit. The course will include student presentations and discussion of research topics and published papers of current interest within the broad field of the biomedical and biobehavioral sciences, focusing on interdisciplinary and systems-related research. Students will be required to make an oral presentation on their research the final semester they enroll in the course for credit. Students will keep current on new findings in the biomedical and biobehavioral sciences and, through presentations and the constructive critiques of course participants, will develop verbal research communication skills. Graded as S/U/F. M.S. students will be enrolled for three semesters; Ph.D. students for four semesters.

CCTR 691. Special Topics in Translational Research. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Restricted to graduate students in clinical and translational sciences programs or by permission of instructor. Translational research improves the "bench-to-bedside" trajectory of health research and is a rapidly evolving field. This course provides exposure opportunities to learn about the latest issues surrounding translational research in various disciplines. Graded S/U/F.

CCTR 692. Special Topics in Translational Research. 1-6 Hours.
Semester course; variable hours. 1-6 credits. Restricted to graduate students in clinical and translational sciences programs or by permission of instructor. Translational research improves the "bench-to-bedside" trajectory of health research and is a rapidly evolving field. This course provides exposure opportunities to learn about the latest issues surrounding translational research in various disciplines.

CCTR 697. Directed Research in Clinical and Translational Sciences. 1-15 Hours.
Semester course; variable hours. 1-5 credits. May be repeated for credit. Research leading to the M.S. or Ph.D. degree and elective research projects for other students. Graded S/U/F.

CCTR 700. Master's Capstone Project. 3 Hours.
Semester course; 3 lecture hours. 3 credits. This course is the final "capstone" product for which a student should enroll after successfully completing 27 credits of didactic course work and directed research hours. Enrollment requires the approval of the program director and student's adviser. Students may select one of two options: 1) and NIH-style grant application demonstrating knowledge of the translational and clinical processes and the regulatory environment in which research is conducted or 2) a scientific research article to be submitted to a peer-reviewed journal. Students will demonstrate that they are able to integrate the core competencies of the master's program into problem resolution as evidenced by the development of a sound, well-written research project grant proposal or research article. Graded as S/U/F.

CCTR 702. Statistics for Genetic Studies I. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students in the psychiatric, behavioral and statistical genetics track of the clinical and translational sciences doctoral program or by permission of instructor. Teaches students statistical methods for multidisciplinary research, specifically presenting the mathematical components that underlie statistical analysis and including probability theory, statistical distributions, inference and linear models.

CCTR 703. Statistics for Genetic Studies II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Restricted to students in the psychiatric, behavioral and statistical genetics track of the clinical and translational sciences doctoral program or by permission of instructor. Builds upon the quantitative statistical methods from CCTR 702. Students will learn the mathematical components that underlie statistical analysis with a focus on maximum-likelihood methods and structural equation modeling. These components provide the necessary foundation for clinical and translational research and the advanced statistical genetic methods for understanding how genetic and environmental factors impact the development of psychiatric and substance abuse disorders.

CCTR 801. Clinical Practicum. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to equip students with knowledge of the translational and clinical research processes and the environments in which research is conducted. Through participation in these practica, the student will observe and develop an appreciation for the role of clinical or translational scientists in the design, conduction and analysis aspects of human research, including data collection, analysis or monitoring; case management of protocol participants; recruitment and enrollment of human subjects; protection of subjects and subjects rights; development of informed consent documents; preparation of adverse event experience reports; construction or monitoring of case report forms; grand and budget development; report preparation; and education of other health care professionals, patients or families regarding clinical and translational studies, protocol development and program administration. Graded S/U/F.

CCTR 802. Research Practicum I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to equip students with knowledge of the translational and clinical research processes and the environments in which research is conducted. Through participation in these practica, the student will observe and develop an appreciation for the role of clinical or translational scientists in the design, conduction and analysis aspects of human research, including data collection, analysis or monitoring; case management of protocol participants; recruitment and enrollment of human subjects; protection of subjects and subjects' rights; development of informed consent documents; preparation of adverse event experience reports; construction or monitoring of case report forms; grand and budget development; report preparation; and education of other health care professionals, patients or families regarding clinical and translational studies, protocol development and program administration. Graded as S/U/F.

CCTR 803. Research Practicum II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Designed to equip students with knowledge of the translational and clinical research processes and the environments in which research is conducted. Through participation in these practica, the student will observe and develop an appreciation for the role of clinical or translational scientists in the design, conduction and analysis aspects of human research, including data collection, analysis or monitoring; case management of protocol participants; recruitment and enrollment of human subjects; protection of subjects and subjects' rights; development of informed consent documents; preparation of adverse event experience reports; construction or monitoring of case report forms; grand and budget development; report preparation; and education of other health care professionals, patients or families regarding clinical and translational studies, protocol development and program administration. Graded as S/U/F.

CCTR 898. Dissertation Research in Clinical and Translational Sciences. 1-10 Hours.
Semester course; variable hours. 1-10 credits. Students will be required to complete a minimum of 15-30 credits under this course number directed toward completion of a dissertation. Prerequisite: admission to candidacy. Dissertation research with a strong interdisciplinary focus, as facilitated by the composition of the research advisory committee. Graded as S/U/F.

Research (OVPR)

OVPR 601. Scientific Integrity. 1 Hour.
Semester course; 1 lecture hour. 1 credit. A survey of contemporary issues relating to responsible conduct in research. Topics include academic integrity, mentoring, authorship and peer review, use of humans and animals in biomedical research, ownership of data, intellectual property, conflict of interest, scientific record keeping, collaborative research, research misconduct, and genetic technology. Graded as pass/fail.

OVPR 602. Responsible Scientific Conduct. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Priority registration to postdoctoral trainees and graduate students; others by permission of instructor. A survey of contemporary issues relating to responsible conduct in research. Topics include research integrity, mentoring, authorship and peer review, use of humans and animals in biomedical research, ownership of data, intellectual property, conflict of interest, scientific record keeping, collaborative research, research misconduct, and genetic technology. Graded pass/fail.

OVPR 603. Responsible Conduct of Research. 1 Hour.
Short course; 1 lecture hour. 1 credit. Restricted to graduate or professional students, with preference given to Preparing Future Faculty students. Registration requires permission of PFF Program office. This course is designed to provide a learning experience that will enable students to develop and refine skills needed to solve problems involving relevant topic areas of responsible scientific conduct and to clearly articulate ethically and legally acceptable solutions to problems posed about scientific conduct. Content of the course includes relevant guidelines, policies and laws bearing on the conduct of scientific research including those dealing with scientific authorship, use of humans and animals in research, conflict of interest, data ownership, scientific record keeping, collaborative research, and ownership, protection and use of intellectual property in the arena of scientific research. Conventions and normative behavior related to responsibilities in the scientific mentor-trainee relationship will also be covered. Graded as pass/fail.

Graduate School

Graduate School (GRAD)

GRAD 601. The Academic Profession. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to graduate or professional students. Designed to introduce graduate students to the roles and responsibilities of faculty members in institutions of higher education. Through readings, discussion and conversations with faculty members from a variety of settings, students will learn about the changing social expectations for higher education, the diverse settings in which faculty work and strategies for developing and presenting marketable academic skills. Graded as pass/fail.

GRAD 602. Teaching and Learning in Higher Education. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Restricted to graduate or professional students. This course focuses on the art and science of teaching and learning in higher education. Graded as pass/fail.

GRAD 604. Teaching, Learning, Technology and the Future of Higher Education. 2 Hours.
Semester course; 2 lecture hours. 2 credits. This course is designed to provide students with an introduction to contemporary technologies and the implications for instructional practices that can serve as both a foundation and a process for continued growth and development in understanding teaching and learning. Throughout the course students will explore and critically examine how the World Wide Web and emerging digital technologies are changing the landscape of learning in higher education. Class sessions will consider key instructional contexts/issues and explore the ways in which digital technology might enhance learning. Specific attention will be given to the ways in which students explore, select, use and assess the use of technology in teaching.

GRAD 605. Professional Specialty Seminar. 1-3 Hours.
Short course; 1-3 seminar hours. 1-3 credits. Prerequisites: GRAD 601 and GRAD 602. Restricted to graduate or professional students. Registration by permission of PFF Program office. Seminars will provide students with the opportunity to focus on the full range of faculty responsibilities specific to their chosen disciplines/professions in such a way that builds on the more general knowledge and skills covered in prerequisite courses. Students will be enrolled in a professional cluster section related to their academic disciplines (such as fine arts, social sciences, physical and life sciences, health sciences, etc.). Graded as pass/fail.

GRAD 606. Internship/Externship in Professional Teaching. 1-3 Hours.
Intern course; 1-3 practicum hours. 1-3 credits. Prerequisites: GRAD 601, 602, 604 or 605; and OVPR 603. Restricted to graduate or professional students. Registration by permission of the PFF Program office after proposal submission and approval. The internship in professional teaching is the capstone experience of the Preparing Future Faculty Program in which students will gain experience and practice in clinical/field or studio instruction under the tutelage of a senior faculty mentor at an institution that most likely mirrors the institution of interest to the student. A proposal agreement must be signed by the faculty mentor who will direct the project and assign the final grade and must be submitted to the PFF Program office for approval before the student enrolls or begins the internship/externship. The proposal must define the project and the intended outcomes, must specify the learning goals and the agreed-upon methods for evaluation, and must identify the institution where the project will take place. At the end of the project, the student must submit to the faculty mentor a report describing the experience and the extent to which the stated goals were accomplished. The faculty mentor will submit the student report, along with an evaluation of the project and the grade to be awarded, to the director of the PFF Program. Each internship/externship course requires approximately 150 contact hours in the form of preparing for and carrying out the project. The student's role is to be one of "junior faculty member" and the faculty member's as guide and mentor. Students must complete all three hours of GRAD 606 for the PFF Certificate of Achievement and must have made final edits and uploads of all relevant materials to their PFF electronic portfolios. Refer to PFF Program website for proposal instructions and electronic portfolio requirements: http://www.graduate.vcu.edu/programs/pff/courses.html. Graded as pass/fail.

GRAD 610. Career and Professional Development Planning for Graduate Students. 1 Hour.
Semester course; 2 lecture hours per week for seven weeks. 1 credit. Prerequisite: graduate standing. This course is designed to assist participants as they navigate the challenges faced when making career choices in a complex global economy. Includes opportunities for self- and career-skills assessment.

GRAD 611. Professional and Personal Development. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Open to graduate students and postdoctoral fellows with permission of instructor. The course will involve self-assessment and development of the student's personal mission statement and individual development plan in consultation with faculty and alumni mentors from the student's discipline.

GRAD 612. Oral Presentation Skill-building for Career Professionals. 1 Hour.
Semester course; 1 lecture hour.1 credit. Graduate standing required. This course focuses exclusively on developing and delivering presentations. Students are expected to create professional presentations representative of their focused research area to be delivered to a "lay" audience. Class exercises focus on audience analysis and strategic choices, theme development, argument construction, and impromptu public speaking as a means to develop confidence in speaking to an audience. Graded as S/U/F.

GRAD 614. Introduction to Grant Writing. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment requires graduate standing. This course introduces the graduate student to the grant-writing process. Topics include basic components of a grant application, writing the proposal, identifying funding sources, understanding proposal guidelines and the grant proposal review process. Graded S/U/F.

GRAD 615. Biomedical Science Careers Seminar Series. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to graduate students and postdoctoral fellows with permission of instructor. Trainees investigate the broad spectrum of potential careers available to biomedical scientists by participating in weekly discussions, each with a scientist who has been successful in a different career path. Graded P/F.

GRAD 616. Becoming an Entrepreneur. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment requires graduate standing. This course introduces the student to the core concepts and resources of entrepreneurship. Topics include recognizing the need for innovation, how to develop a business plan, building an effective team, intellectual property, patent and trademark strategy, marketing strategy and cultivating funding sources. Graded S/U/F.

GRAD 617. Biomedical Sciences Projects in the Community. 2 Hours.
Semester course; 1 lecture hour and 1 service-learning/laboratory hour. 2 credits. Prerequisite: Enrollment requires graduate standing. The community service based experiential learning project is selected to provide an integrative learning experience that addresses the practice of citizenship and promotes an awareness of and participation in public affairs. Service projects will be selected to benefit a community organization, agency, public service provider, the VCU BEST program or another unit within the university. The goal of these projects is to provide students with an opportunity to gain firsthand exposure to specific target populations/organizations, observing the needs and current efforts, if any, to address those needs. Community partners will include nonprofit agencies, schools, worksites, hospitals and state and local health departments. Approved experiential learning placements and assignments will vary depending on the specific project topic and learning objectives. Reflection, project/activity presentation and website narratives will be required for the experiential learning project.

GRAD 691. Topics in Graduate Education. 1-15 Hours.
Variable lecture hours. Variable credit. Restricted to graduate or professional students. A seminar course for the examination of specialized issues, topics, readings, problems or areas of interest for all graduate students, such as the responsible conduct of research, globalization, mentoring, service-learning and areas of interest for graduate students interested in careers within and outside of academe. This course is open to all graduate, postgraduate and professional students unless specifically restricted. Graded as P/F.

GRAD 693. Graduate Internship. 1-9 Hours.
Semester course; variable hours (60 hours per credit). 1-9 credits. Students will spend 60 to 540 hours in a planned, supervised experience with an agency or business. A summary of work duties and how internship relates to degree program along with confirmation of hours worked must be submitted. Must consult with and have approval from current degree program director for course to count in degree program. Graded as S/U/F.

GRAD 697. Directed Research. 3,6 Hours.
Semester course; 3, 6 research hours. 3, 6 credits. Prerequisite: completion of all course work in M.I.S. program's individualized course of study concentration and approval of final research project proposal and degree candidacy. Restricted to graduate or professional students. Registration by permission of M.I.S. graduate program director. A final directed research study for the M.I.S. capstone project culminating in a synthesis of the academic focus areas of the student's M.I.S. curriculum plan. Students must receive a grade of A or B. A maximum of 6 credits applicable to the M.I.S. degree.

Academic Affairs

Community Studies (CMST)

CMST 691. Special Topics in Community Studies. 1-3 Hours.
Semester course; 1-3 variable hours. 1-3 credits. May be repeated for a maximum of 6 credits. Prerequisite: permission of instructor. Provides an in-depth study of a selected topic related to community studies. See the Schedule of Classes for specific topics to be offered each semester. If several topics of different content are offered, students may elect to take more than one.

CMST 692. Independent Study in Community Studies. 1-3 Hours.
Semester course; 1-3 variable hours. 1-3 credits. Prerequisite: permission of instructor. Intensive study or research under supervision of a faculty member in an area not covered in-depth or contained in other VCU graduate-level courses.

Center for Interprofessional Education and Collaborative Care

Interprofessional Education and Collaborative Care (IPEC)

IPEC 501. Foundations of Interprofessional Practice. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Open to students enrolled in a professional health science degree program. An introductory study of the concept of interprofessional collaborative practice, this course includes units on health care systems, teams and teamwork, and professional roles and responsibilities. Students actively work within interprofessional student teams to apply course content during specific learning activities that build a foundation of the knowledge, skills and attitudes necessary for effective interprofessional practice in contemporary health care.

IPEC 502. Interprofessional Quality Improvement and Patient Safety. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: IPEC 501. Course restricted to students enrolled in the schools of Medicine, Nursing and Pharmacy. A study of interprofessional quality improvement and patient safety, this course includes units on quality in the workplace, error in the health care system and improving health care. Students actively work within interprofessional student teams to apply course content to specific learning activities for interprofessional quality improvement and patient safety practice.

IPEC 510. Interprofessional Communication and the Care Coordinator I. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Enrollment requires acceptance into the Care Coordination Certificate program. Defines the various roles of the care coordinator. Identifies all health care providers on the interprofessional team and what their responsibilities are to patient and family care. Focuses on development of effective interprofessional communication and leadership strategies by introducing concepts of teamwork. Explores strategies for conflict negotiation and patient engagement. Facilitates the sharing of individual perspectives and patient care experiences.

IPEC 511. U.S. Health Care and Care Coordination. 2 Hours.
Semester course; 2 lecture hours, delivered online. 2 credits. Enrollment requires acceptance into the Care Coordination Certificate program. Explores the overall infrastructure of the health care system and care delivery models. Introduces concepts of regulation. Examines how the effect of different settings and levels of care impact care transitions. Explores effective use of the electronic health record. Identifies the patient-centered care model as integral to improving outcomes. Describes the best ways to share information across health care settings during care transitions.

IPEC 512. Health Care Payment Models and Care Coordination. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Enrollment is restricted to students accepted into the care coordination certificate program. Examines aspects of health care financing that affect the type of services the care coordinator can provide. Provides an overview of key points related to insurance coverage, including managed care, Medicare and Medicaid. Reinforces the utilization review process and compliance. Discusses an overview of current U.S. health policy with a special focus on vulnerable patients and the importance of population health management.

IPEC 513. Ethical and Legal Considerations in Care Coordination. 2 Hours.
Semester course; 2 lecture hours, delivered online. 2 credits. Prerequisite: IPEC 512; corequisite: IPEC 515. Focuses on applying ethical decision-making frameworks to analyze ethical dilemmas that occur with patient care and between members of the interprofessional team. Examines care coordinator role conflict between patient advocacy versus health system advocacy. Provides a framework for identifying potential liabilities while working in the care coordinator role. Examines issues surrounding access to care and social justice. Explores legal responsibilities of the care coordinator.

IPEC 514. Hospital-based Care Coordination. 3 Hours.
Semester course; 3 lecture hours (delivered online). 3 credits. Prerequisites: IPEC 510, IPEC 511 and IPEC 512. Enrollment restricted to students accepted into the care coordination certificate program. Explores care coordination in the hospital setting with a focus on discharge planning, medication reconciliation and effective care transitions out of the hospital. Addresses how to identify those patients who have high risk for excess utilization of hospital resources due to limited financial means, lack of insurance, chronic illness, and/or catastrophic injury. Addresses national recommendations for effective care coordination strategies to improve patient outcomes.

IPEC 515. Interprofessional Communication and the Care Coordinator II. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: IPEC 510. Reinforces roles and responsibilities of health care providers on the interprofessional team during care coordination and prepares students to assume a professional role. Applies effective interprofessional communication and leadership strategies by reinforcing concepts of teamwork. Explores strategies for conflict negotiation and patient engagement. Facilitates the sharing of individual perspectives and patient care experiences.

IPEC 516. Community-based Care Coordination. 3 Hours.
Semester course; 3 lecture hours, delivered online. 3 credits. Prerequisites: IPEC 514 and IPEC 515. Emphasizes the value of maintaining a primary care provider and connecting the patient with appropriate community resources. Emphasis will be on the patient-centered medical home model of health care delivery, which provides an environment conducive to direct coordination of a patient's primary care with a special focus on effective care transitions. Discusses concepts of advanced care planning, medication management and patient engagement from the outpatient perspective. Identifies how to differentiate high-risk patient populations and provide effective transitions of care within community settings. Introduces concepts of population health and the role of the family in care of the patient.

IPEC 525. Mindfulness Practices for Health Care Professionals: Clinical Applications. 1 Hour.
Semester course; 16 hours (lecture/seminar). 1 credit. Open to health care professional students in good standing (e.g. students in the schools of Dentistry, Nursing, Medicine, Pharmacy, Allied Health Professions or Social Work or in the programs of dental hygiene or clinical psychology). This course will allow a qualified health care professional student the opportunity to participate in a variety of mindfulness practices and learn their applications to clinical practice.

IPEC 528. Global Health. 1 Hour.
Semester course; 1 lecture hour. 1 credit. This course is designed for professional students in medicine, pharmacy and physical therapy traveling to the Dominican Republic, Honduras or Peru with the Humanitarian Outreach Medical Brigade Relief Effort. With a focus on clinical and research endeavors in Central and South American countries, this course provides a foundation in interprofessional teamwork and international health care for health professions students. Themes of cultural competency, determinants of health, clinical skills and ethical issues are interwoven throughout the course. Graded as Pass/Fail.

IPEC 561. IPE Virtual Geriatric Case. 2 Hours.
Semester course; 2 lecture hours (delivered online). 2 credits. Using a web-based interface, health professional students from multiple disciplines will collaborate to identify health care needs and plan care for an older adult patient. Contemporary theoretical concepts and evidence-based recommendations are integrated within a complex, unfolding case that crosses all settings and services of care: ambulatory, inpatient, post-acute, community-based and palliative/end-of-life. Patient- and family-centered care concepts are also emphasized throughout each module. Students who participate in this preceptor-supervised virtual case will make decisions based on their discipline-specific geriatric-gerontological competencies, reinforce understandings about the scope of practice for other health professions and expand working capacity for interprofessionalism and team-based care.

IPEC 562. IPE Quality Improvement Project Practicum. 2 Hours.
Semester course; 2 lecture hours. 2 credits. Prerequisite: IPEC 502 or HADM 609 or approval by course director. Enrollment restricted to students in the schools of Allied Health Professions, Medicine, Nursing and Pharmacy. This capstone course will provide interprofessional teams of students the opportunity to apply quality improvement processes and patient safety theories, models, methods, and tools in a health care setting to execute a quality improvement project in an organizational setting. Graded as Pass/Fail.

IPEC 591. Interprofessional Special Topics. 1-3 Hours.
Semester course; 1-3 lecture hours. 1-3 credits. May be repeated for credit. Explores specific topics in interprofessional education and collaborative care theory and practice. Sections may include lecture and/or clinical hours. See Schedule of Classes for topics offered each semester. Graded as pass/fail.

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